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NOVEMBER

1939

Vol. IV

No. 48

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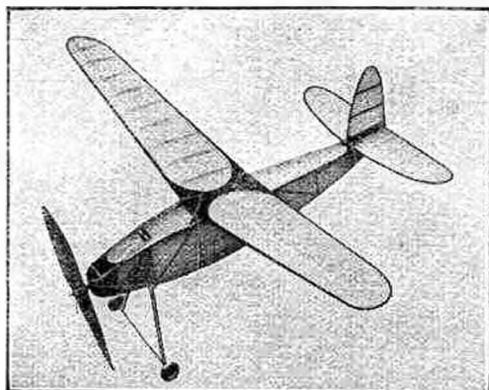
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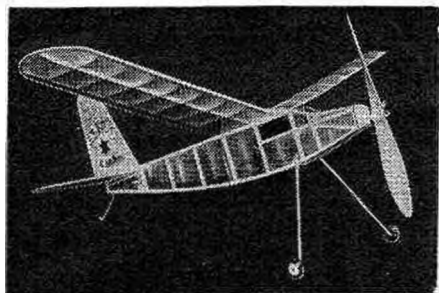
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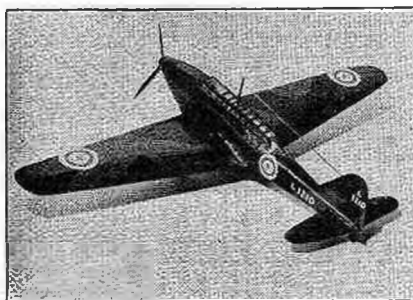
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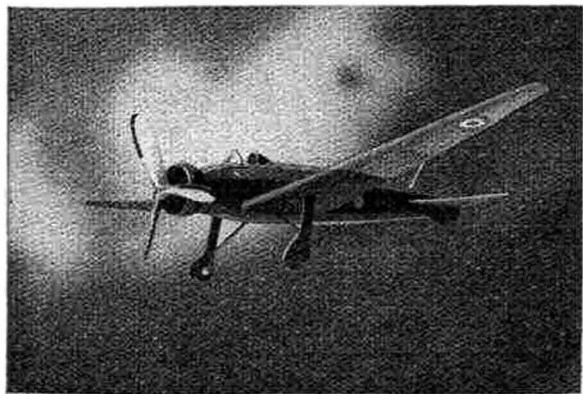
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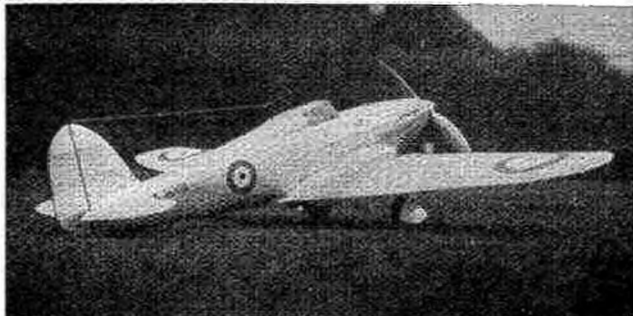
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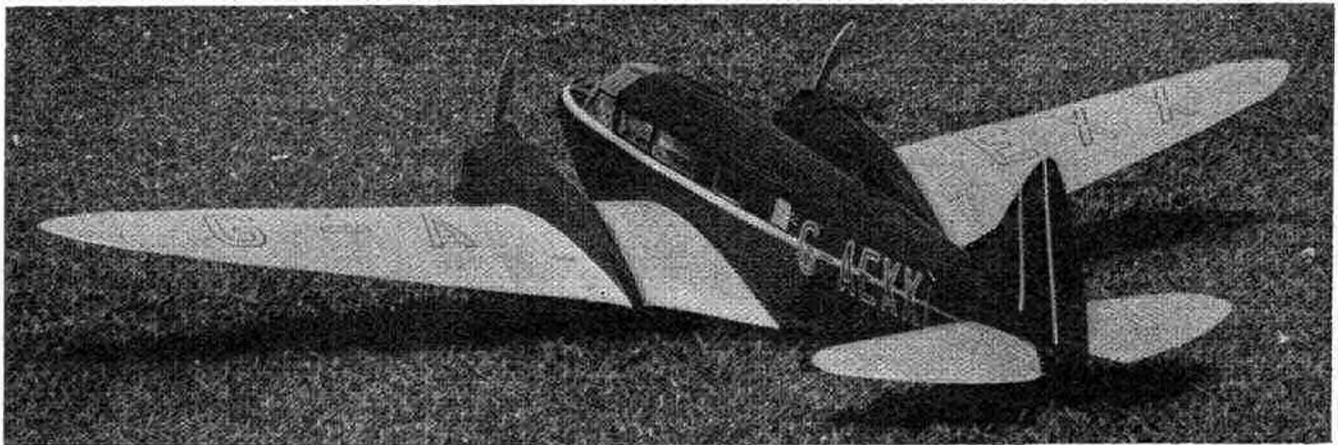
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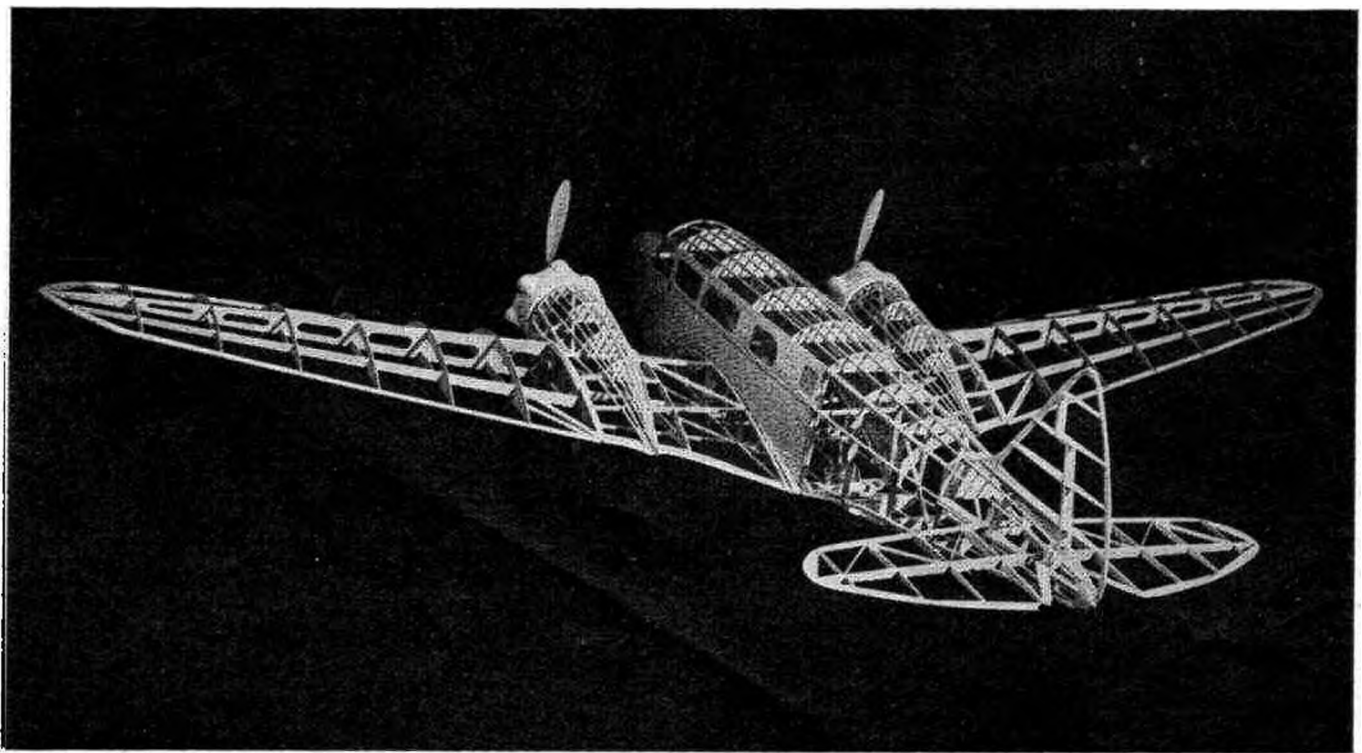
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TOWNER'S AIRSPEED "ENVOY"



*Probably the finest flying scale model of a twin-engined aircraft in existence, this beautifully made model is fully illustrated and described in this issue.
Span of the model is 54 in. and length is 34½ in.*



Our front cover photo was taken by Mr. C. W. Edwards, of Halifax.

The AERO-MODELLER

NOVEMBER - 1939

Vol. IV. - No. 48

Tel. Leicester 65322

INCORPORATING THE 'MODEL AEROPLANE CONSTRUCTOR'

EDITORIAL



WITH five weeks of the war behind us, and not a bomb dropped in the country—some-what to the surprise of some folk!—one would not expect to find aero-modellers devoting much less time to their models, and such is the case.

A large number of readers have written to us saying that they are already embarking on an enlarged "winter programme" of model building; and the Wakefield "fans" keep asking if the 1940 rules will be the same as for 1939? Which brings us to the S.M.A.E., and a letter from Mr. D. A. Gordon, of the Hornchurch Club, addressed to "Clubman," and which is quoted by him in this month's report. What is the S.M.A.E. doing? Surely by now a pronouncement as to its war-time policy should have been made? We hear of an "instruction," issued by the President to the Hon. Sec., to call in all cups and trophies for lodgment in a safe place. But surely the *goodwill* and *standing* of the Society is of more importance than its prizes? Whilst we are quite satisfied that aero-modellers *individually* are intending to carry on unaffected by the war, we note that a number of clubs have suspended operations "for the duration." The biggest mistake they could have made. And it is in this respect that we regret that the S.M.A.E. has not given the clubs a lead by making a pronouncement of its intentions, which, in our opinion, should be that it would continue to function as before. President, chairman, secretary, Press secretary, Council, monthly meeting—not a word from anyone of them about anything.

* * * * *

As for THE AERO-MODELLER, with this issue we complete our fourth year of publication, the last 2½ years of which have been under the present management.

During that period the journal has increased in size from 32 to 64 pages, plus, in recent months, an insert plan.

In nett circulation, the increase during that same period has been from under 6,000 to over 22,000 copies per month.

As for our "war policy," we shall publish more articles on the scale type of military aircraft, such as bombers and fighters, in view of the greater interest which will undoubtedly attach to them.

In our August issue we advertised for a sub-editor and draughtsman, and received a considerable number of replies. Not able to find both abilities combined to our satisfaction in the one person, we joined two new members to our staff, Mr. J. H. Elwell and Mr. C. A. H. Pollitt, both of them experienced aero-modellists.

Mr. Elwell was, since its inception, hon. sec. of the Westwood (Beverley, Yorks.) M.A.C., and was for several years on the staff of a Yorkshire newspaper before joining us some weeks ago as sub-editor.

Mr. Pollitt is a fully qualified draughtsman, and has had a number of years' experience on full-sized aircraft with Messrs. Bristol Aeroplane Co. and the Rolls-Royce Co. Mr. Pollitt will in future draw out the plans published in THE AERO-MODELLER. His first appears this month, the blue print of the Miles "Magister." In our next issue we shall publish full instructions for building a flying scale model of the Supermarine "Spitfire," which Mr. Pollitt has designed, and for which he will draw out plans for a blue print to be given away free with each copy.

We shall thus commence our fifth year of publication, if not under the brightest of stars, certainly with an enlarged staff capable of giving to our readers first-class material, and able to deal with the steadily increasing correspondence we receive consequent on our steadily increasing circulation throughout the country.

* * * * *

As we pointed out in our last month's Editorial, we thought it best to hold over the "Buyers' Guide" we were compiling, and to somewhat cut down the size of the issue, as paper had, on the outbreak of war, come under Government control, and was likely to be restricted. We are now pleased to announce that, as the result of arrangements we have made, we can look forward to a regular supply of paper, which will enable us to get back to more pages per issue, though not to our pre-war size.

However, with a slight rearrangement of certain features, we shall have as much space as ever to devote to model aircraft constructional articles, and we feel that *this* issue is quite up to our usual standard, both in quality and quantity. The "Buyers' Guide" is now nearing completion, and copies will be given away free with our next issue. This, of course, will be our Christmas Double Number, much enlarged, and containing

many extra features, a number of which are detailed below. It will be noticed that there is another story by Arthur Mountstephens, creator of that unique aero-modeller, Job! In our Christmas Number, Amos, Job's son, takes the centre of the stage. The story is really good. Job has come to stay, and each month we shall record the latest news of him, his wife Sadie, and young Amos.

* * * * *

We regret the delay in delivery of our last issue in certain parts of the country, inevitable really with so much transport under Government control for the movement of troops and war equipment. And this resulted in entrants for our photographic competition having barely time to get their entries posted before the closing date.

In fact, some entries did arrive late, and a number of readers wrote to say they knew they could not get their entries away in time. We have, therefore, arranged to extend the competition for another month, making the closing date October 31st. All entries so far received, no matter when, will, therefore, be eligible; and all further entries which we receive up to first post October 31st.

We trust that this extension will encourage many more readers to send in their photos. Remember, all prizes are in cash; and with results published in our next issue they will come in very handy for that Christmas buying!

* * * * *

In our last issue we published an announcement on behalf of the Model Aeronautics Council of Eire, inviting all interested aero-modellers to communicate with the Hon. Sec. at 7 Crampton Quay, Dublin. The M.A.C.E. is composed of delegates from the model clubs, and it is

hoped to develop the sport throughout the country. Mr. C. F. Bruton, the Hon. Sec., writes:—

"We have a long battle before us to obtain international recognition from the F.A.I. This is going to be very difficult. You see, the F.A.I. consider that we are part of the British Empire, and say that we should affiliate with the Royal Aero Club. On the other hand our authorities hold that we should be recognised as a separate nation (the old story), and do not wish us to come under the R.A.C. Again, if the F.A.I. recognise us, it would have to be through our National Aero Club, but there is no such thing in Eire!"

Well, this seems a typically Irish situation, and as one war is quite enough for us, we are not going to offer any comment on it, other than to wish them all the best in sorting out their difficulty!

* * * * *

And so to the end of another Editorial. Below are printed advance details of our next issue—our 1939 Double Christmas Number—with free plan and the "Buyers' Guide." On the back inside cover of this issue is printed an order form, which should be filled in and passed to their local newsagents by all readers who have not yet placed an order for regular delivery of their copy of this journal.

To avoid wastage, and cut down unnecessary transport charges, odd copies will not be available on bookstalls, but ample supplies will always be available for those readers who order their copies in advance. We have a few copies of the last (October) issue available, and if any readers failed to get a copy we shall be pleased to supply them with copies post free whilst our stock lasts. Remittances of 6d. should be sent to our Leicester offices.

THE EDITOR.

SPECIAL FEATURES IN NEXT MONTH'S ISSUE

ON SALE NOVEMBER 22nd, 1939

GRAND CHRISTMAS DOUBLE NUMBER!

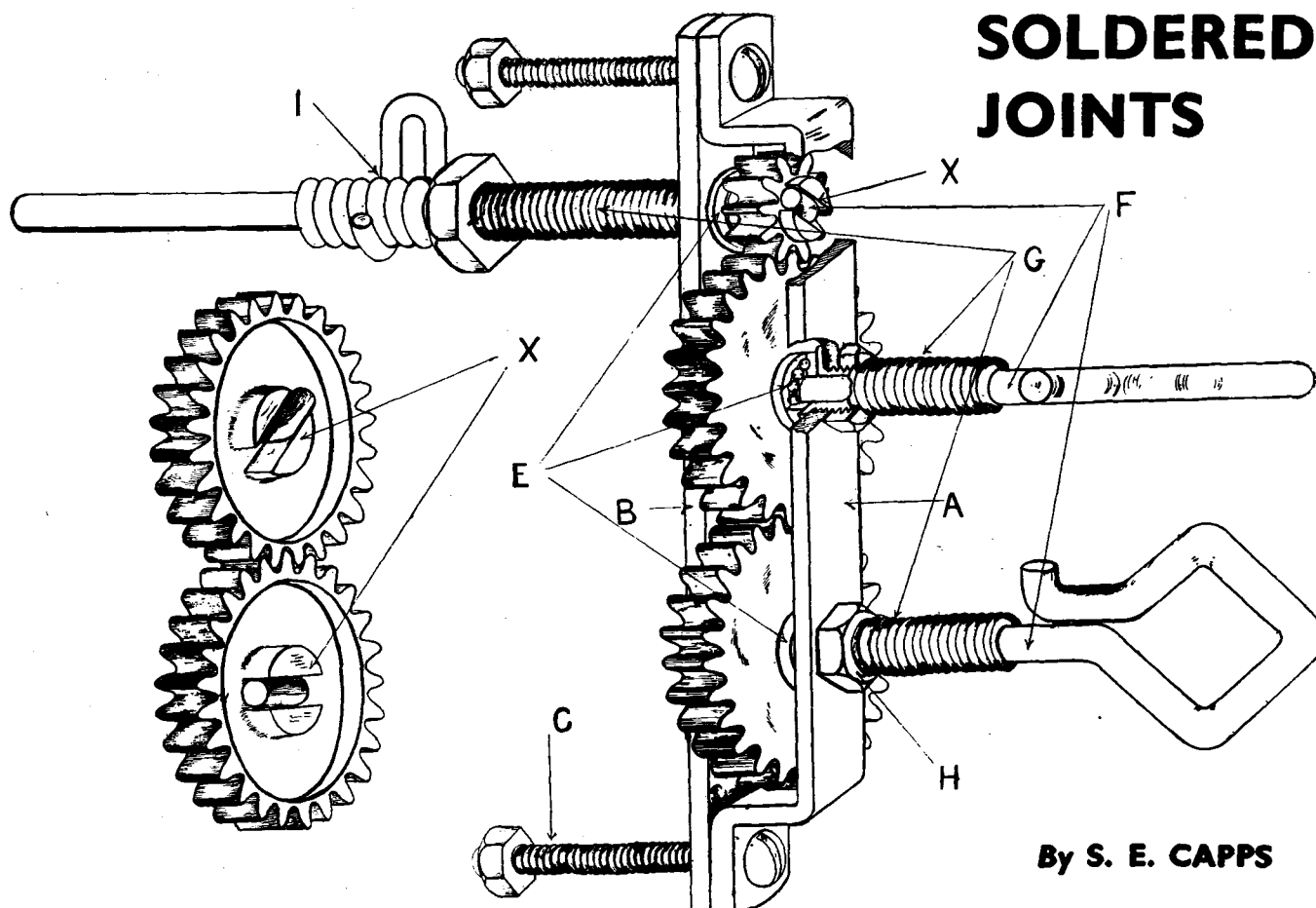
- ★ PETROL-ENGINEED FLYING BOATS AND SEAPLANES ... By Major C. E. Bowden
- ★ "TOC, ACK, TOCK, ACK," (Another story about Job and Amos) ... By Arthur Mountstephens
- ★ THE DOUGLAS DIVE-BOMBER. (Full-size scale plans for a 14½ span Flying Scale Model, with full instructions for Building) ... By Robert McLarren
- ★ FURTHER ADVICE ABOUT CLUB ACCOUNTS ... By "Diganos"
- ★ ANOTHER METHOD OF TENSIONING RUBBER MOTORS ... By S. E. Capps
- ★ RECENT TRENDS OF DESIGN IN FIGHTER AIRCRAFT ... By Peter Garrod Chinn
(All about the latest Fighters in service in Europe and America)
- ★ MORE CONSTRUCTIONAL NOTES FOR THE BEGINNER ... By "Instructor"
- ★ THE SUPERMARINE "SPITFIRE" (Britain's Faster Fighter) ... By C. A. H. Pollitt

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This Guide will contain, arranged alphabetically, a list of every kind of accessory used in model aircraft construction, with names of firms from whom each accessory may be obtained, also hundreds of names and addresses of Model Aircraft Firms all over the country, from whom you can obtain model aircraft supplies. Never before has such a useful Guide been published ... and never again will you want to be without one ... you will find it so helpful!

A MODEL MULTI-GEARBOX WITH NO SOLDERED JOINTS



By S. E. CAPPS

OF all the troubles that beset the aero-modeller, to have a gearbox break one or more parts (usually the soldered joints between gear-wheel and shaft) is probably the worst. Frame repairs can be rectified on the flying ground, but gearbox troubles usually means a trip back to the workshop for repairs and a spoilt afternoon. The writer has experienced all the troubles that can be met with in using gearboxes, and has no doubt that others have had the same misfortune. Now, before going any further, let it be understood that the voice that says there is no advantage to be gained in using gears should not be allowed to set one against their use, as it should suffice to say that some models fly better with them. But there is no doubt that trouble that can be met with in gearboxes can be sufficient to cause any modeller to discard them in favour of the single motor direct drive, with its simple fitting. However, it is thought that some, like the writer, prefer to use gears, and these may be interested in the gear unit described here, which was designed to remove, as far as possible, the troubles mentioned above.

The main points considered in the design of this gear unit were: the avoidance of all soldered joints, free running bearings, adequate absorption of the thrust, and extreme rigidity of the finished unit.

It will be seen that the unit in the sketch was built round these points. The frame A and B is formed from strip steel, as shown, part A being secured to B by

screws C, which are long enough to fasten the unit to the noseblock of the model.

The distance between A and B is sufficient to take the thickness of the gearwheel and the ballbearing thrust races E. The spindles F are attached to the gearwheels by bending the ends as shown and fitting them into slots filed in the centres of hubs. This fixing is the best for ease of construction and assembly, and will stand any motor load that is imposed. With this method it will be seen that soldered joints have been avoided. The spindles are carried in long screwed bushes G, which are located in the frame members A/B, and secured by nuts H. The correct drilling of these holes can be assured by adopting the method for this class of work described by the writer in *THE AERO-MODELLER* some while back. The thrust races E placed between the frame and the gearwheel look after the pull of the motors and the airscrew effectively, and are more efficient than the ends of the bushes.

The illustration makes these points clear, and it will be seen that the frame when assembled will retain the spindle ends in the gear slots, but allowing the whole to revolve freely. The driving clutch I is made to grip the shaft by winding the wire on a smaller size than the airscrew shaft. (The writer has avoided any particular sizes in this description, as it is thought that as most models differ considerably one certain size unit would not suit every model).



A 1 in. TO-THE-FOOT THE AIRSPEED "ENVOY"

Mr. Towner with his model. Span is 54 in., length 34½ in., and weight 9½ oz.

THIS particular prototype was chosen because of its adaptability to a simple twin-engined layout by arranging for the rubber motors to work through the centre section ribs and thus eliminate any complicated gear or crank drive. The flexible drive in the cowlings to convert the angular drive to a parallel drive consists of a light spring which is in flexion during the whole of the motor run.

A further object in keeping the rubber motors confined to the centre section only is to keep the weight off the tail and thus saves adding weight to the nose to obtain trim. The actual model balanced correctly on completion. Naturally, only smallish motors can be incorporated, but by using long motors, any subsequent bunching does not affect the trim. As a matter of fact, 35 sec. motor run is definitely obtainable, and with a wing loading of 6.8 oz. per square foot a satisfactory performance is assured.

Although both airscrews turn in the same direction, torque is not troublesome, and any turning tendency which should be only slight is easily corrected by either putting more turns on the left-hand motor or adding a further loop of rubber. The cowls, too, can be slightly offset.

The construction is straightforward and the final line-up should be correct if the instructions are carried out.

Commence by building the main wing beam of good hard balsa. Build this on the drawing in the usual way, and then add the front portions of the centre section ribs. These six ribs are all made in two halves. Add the leading edge and well brace, thus forming a very strong box girder.

The rear portions of the ribs can now be cemented into place, connected together with the trailing edge and cross members.

The fuselage is straightforward; build the two main frames on the flat and connect top and bottom spacers as usual. Well brace where the centre section fits. The

whole centre section is detachable for fitting and inspecting the motors. The attachment is quite simple.

Two aluminium spigots on the centre section trailing edge are first offered up and rest on the top of the bottom spacer of former G.

The rest of the centre section is now brought up into place and a dowel, hard balsa, is inserted through the aluminium side plates and paper tubes in the fuselage. Note that the rear ends of ribs A extend beyond spacer G and form a register to prevent side play. The rear hook is made up out of aluminium and is a press fit on the centre section trailing edge.

The landing gear consists of a transverse $\frac{1}{8}$ in. g steel wire in one piece from axle to axle, with a further $\frac{1}{8}$ in. g steel wire well soldered to it forming a rear strut. This assembly is well bound and cemented to the leading edge and main wing beam respectively. The actual spring is imparted by this assembly, and gives an up and down movement only. A further leg is hinged immediately behind the wheel, and slides in a flexible bush (expanding curtain rod) attached to the leading edge. This leg takes no load.

The cowlings are built up of 1 in. thick balsa, all joints being staggered and carved to shape. They are, of course, detachable, and first plug into the three-ply rings on the front end of the nacelles.

Note that downthrust is incorporated. The airscrews were commercial 9 in. props known as pawlonia, a hard, light wood, and work well. The boss and spinner being added.

The wing construction is unusual, but very strong. A main spar is made the full depth of the wing and slotted at the rib positions.

The ribs have the centres cut out and are also slotted to accommodate the spar. The spar is now inserted through the ribs horizontally, and then turned through an angle of 90 deg., when the spar and ribs all lock together.

I have found on the usual type of slotted spar and slotted ribs that the cement on contraction tends to warp the main spar either up or down, but the method used on the Envoy overcomes this difficulty by having an opposing and counteracting force at each joint. No ailerons or controls of any kind are fitted as these, instead of helping to trim a model, are generally deranged after every flight, and cause more crack-ups than any other cause when they are fitted.

Most detachable cantilever wings in the past have suffered from either too firm a fixing which rips out on a bad landing, or too loose so that the wings flutter in flight.

Shear pins overcome this difficulty, but if in the customary position are difficult to prize out when shorn off hard against the rib face. It was to overcome this difficulty that the vertical shear pin method was evolved.

SCALE FLYING MODEL

Designed and Built _____ by H. J. TOWNER

Mr. Towner hand launches his model. With a motor run of 35 seconds, flights of between 200 and 300 yards can be obtained.

On a pin shearing a new one is inserted which pushes the old one out and clear of the model altogether. The pin itself is hard balsa, but not too hard, $\frac{1}{8}$ in. square, the hole in the aluminium "U" piece forming the circular section as the pin is pushed through.

The celluloid wind-shield is braced with $\frac{1}{16}$ in. square cane, steamed to shape, and the panes fitted individually, care being taken to use a hard-setting, waterproof glue, not cellulose cement, so that any surplus does not affect the celluloid.

The whole job is finished in a good quality light tissue, pasted on and over the sheet balsa as well. If put on well and in small pieces instead of trying to cover the whole job at once, no wrinkles should appear, and only one coat of dope is necessary. Too much tension distorts the whole thing and spoils the appearance by giving too much prominence to ribs, longerons, etc. Colour with a thin cellulose finish. Red above waist line, blue beneath silver wings and red nacelles. The rudder and fin is blue, with a red centre strip and thin white stripes either side. A white tapering line divides the two colours of the fuselage and completes G—AEXX of "The King's Flight."

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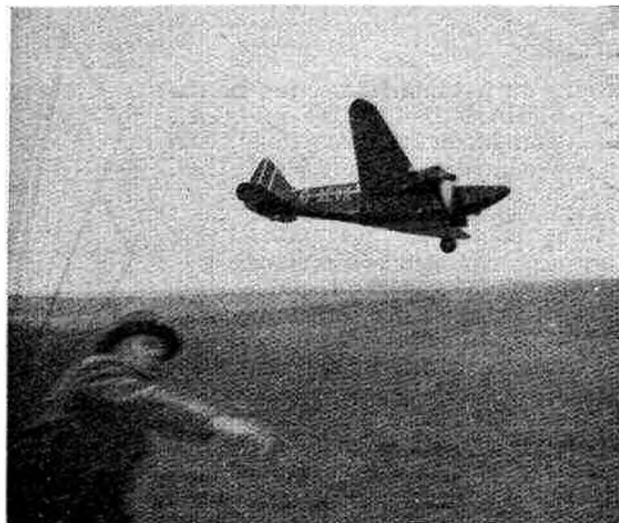
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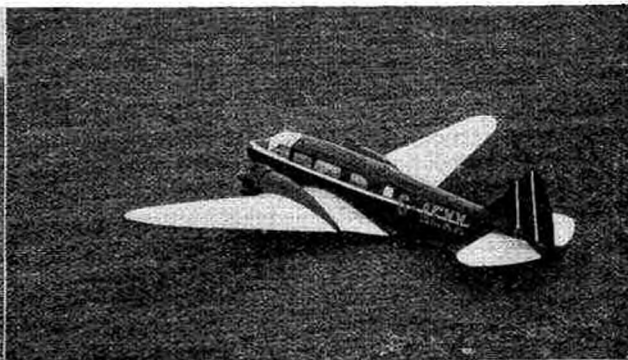
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LIST OF MATERIALS FOR THE ENVOY.

- | | |
|--|------------------------------------|
| $\frac{1}{8}$ in. x $\frac{1}{8}$ in. x 8 ft. balsa | 8 lengths fuselage. |
| $\frac{1}{8}$ in. x $\frac{1}{8}$ in. x 8 ft. hard balsa | 8 " centre section. |
| $\frac{1}{16}$ in. x $\frac{1}{16}$ in. x 8 ft. balsa | 12 " stringers. |
| $\frac{1}{16}$ in. x 3 in. x 3 ft. " | 3 " ribs LE and TE, etc. |
| $\frac{1}{16}$ in. x 3 in. x 3 ft. " | 4 " covering |
| 1 in. x $1\frac{1}{2}$ in. x 2 ft. " | 1 length spar rib rods, etc. |
| $\frac{1}{8}$ in. x 3 in. x 8 in. " | 1 " cowls. |
| $\frac{1}{8}$ in. x 3 in. x 12 in. 8-ply | 1 " Cowl centres. |
| 1 mm. x 3 in. x 3 in. " | 16-gauge plated piano wire 4 feet. |
| 18- " " " " | 18 in. long. |
| 28- " " " " | 1 coil for flex drive. |
| 2 Brass-screwed bushes and nuts, 18-gauge hole. | |
| Aluminium 22-gauge sheet, 6 in. square. | |
| " 26- " " " " | 2 " tail wheel forks. |
| 2 Plastic electric light adaptor tops, small, for crankcases. | |
| 2 $2\frac{1}{4}$ in. dia. airwheels (Trexlar). | |
| 1 $\frac{3}{4}$ in. dia. celluloid tail wheel. | |
| Expanding curtain rod, 6 in. | |
| Hardwood for nose-block; $\frac{1}{8}$ in. dia. birch dowel, 3 in. long; celluloid; 16 brass screws, $\frac{1}{4}$ in. long; cup washers; $\frac{1}{16}$ in. square cane; 2 pawlonia hardwood, 9 in. dia., R.H. props. Tissue, dope, cement, and cellulose enamel. | |



Notes on a Council Meeting of the S.M.A.E., held at the Y.M.C.A., Tottenham Court Road, on Wednesday, August 30th, 1939.

Dr. Thurston took the chair.

The minutes of the previous two meetings were read and confirmed.

Arising from the correspondence, it was stated that the High Wycombe M.A.C. had amalgamated with the Wycombe M.A.A. The new body wished to retain the timekeepers of both clubs under their next re-affiliation. The council were given to understand that this brought the number of timekeepers up to twelve. The request was thereupon sanctioned.

A letter from the Blackheath M.F.C. stated that they had called several meetings and booked rooms in an endeavour to get the area scheme started in the S.E. London district. At these meetings only four other clubs had been represented. They therefore asked the council for its guidance. The hon. secretary was instructed to write to the clubs in the S.E. London area, pointing out that it was their duty to send delegates when an area meeting was called. The council decided that no clubs should be individually represented on the council after the A.G.M., to be held in January next.

Mr. Cosh, the hon. secretary, then read a letter from Dr. Thurston, in which he offered the S.M.A.E. a cup. He suggested that this should be given on the lines of the Plugge Cup, but for individual championship. The actual rules to be left to the competition committee. The council thanked Dr. Thurston for his generosity.

It was announced that the Royal Aeronautical Society, having now settled in their new headquarters, had offered the S.M.A.E. a room for holding council meetings. The council expressed their thanks to the Royal Aeronautical Society and asked that arrangements be made for a council meeting to be held on a fixed date each month.

Owing to the international situation, the hon. treasurer, Mr. L. J. Hawkins, was unable to be present, as his firm had been evacuated. It was therefore impossible for him to attend the meeting in order to present balance sheets of the Wakefield Cup and King Peter Cup funds. It was pointed out that this was the first occasion on which Mr. Hawkins had not been present at a council meeting since his appointment, and this only due to a national emergency.

Dr. Thurston then gave a report on the last F.A.I. meeting. He stated that Italy, Germany and Poland wished certain alterations to be made to rules relating to the cross-sectional area of models. It was also desired that the rules relating to the timing of models should be altered, some countries wishing the timekeepers to follow the models. The council decided that a letter should be sent to the F.A.I. pointing out that the S.M.A.E. were not in agreement with these suggested alterations, and that a treatise on the subject should be prepared and forwarded to the F.A.I. in time for the next meeting, to be held on September 16th. It was also requested that the F.A.I.



circulate the S.M.A.E. objections to other countries. It was proposed and passed that the Society write to the Royal Aero Club requesting that notifications of impending meetings of the F.A.I. be sent to Mr. Cosh.

The council also desired that a letter be sent to the Royal Aero Club requesting that official S.M.A.E. timekeepers be recognised for the purpose of timing F.A.I. records.

The question of the S.M.A.E. representation at the F.A.I. Model Commission was next discussed, and Dr. Thurston and Mr. Houlberg were elected for the September meeting. The council passed a vote of thanks to these two gentlemen for the assistance they have given the S.M.A.E. in the past, and the help they offered to give at the next meeting without any financial aid from the S.M.A.E. The council then considered electing an official F.A.I. delegate, and it was passed that this matter be put on the agenda for the next A.G.M., together with the question of financial expenses.

The area scheme was then discussed, and it was decided that area or proxy delegates attending the council meetings should only vote for clubs attending the area meetings.

The following clubs were re-affiliated :—

Warwickshire M.A.C.	Ashton and Dist. M.A.C.
Blackpool M.A.C.	York M.A.S.
Hampton Hill M.A.C.	Dagenham M.A.C.
Sheffield and Dist. M.A.C.	Hackney M.A.C.

Sanction for flying petrol models on various grounds was given to the following clubs :—

Stoneygate M.A.C.	Yeovil.	Devon and Exeter.
Wycombe.		

The Aspinall A.M.C., with twenty members, were affiliated. This club is running a class of juniors, which the club supports. The council desired it to be made clear that these juniors were not eligible to take part in S.M.A.E. competitions as affiliated club members, nor were they to have a vote on matters pertaining to the S.M.A.E.

Mr. Cosh then gave a report on the Wakefield Competition, held in New York. A vote of thanks was carried to the team and officials, and those who accompanied the team, for the good work they had done.

Mr. Rushbrooke asked that the Wakefield Cup Fund, 1940, should be commenced immediately. This was carried.

The following gentlemen attended the council meeting as representatives for various areas :—

Mr. D. A. Gordon (North-East London).
Mr. M. R. Knight (South-West London).
Mr. C. S. Rushbrooke (North-Western Area).
Mr. E. A. Ross (Proxy delegate for Western Area).

The meeting closed at 11 p.m. with a vote of thanks to the chair.

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WITH our August issue were presented full size scale plans of an attractive high wing cabin type duration 'plane, the AW-6, and for which kits were put up by two of our advertisers. One of them, Super Scale Kits, of Uppingham, recently sent a sample along, and the photos above are of the models built from the kit.

The design of the model, whilst straightforward, is quite attractive, and except for the large diameter propeller, the model has quite a scale appearance. The undercarriage has compression springs, which are operated by the legs sliding in the spring containers, just like full-size "oleo" legs. The tailplane is mounted on a hinge or pivot, so that very accurate adjustment can be made; the hooks for the rubber at the rear of the fuselage are readily accessible; in fact, the model bristles with practical features.

The kit is well put up, in a strong and attractively labelled box, and is very complete. The balsa is of first grade, and there are a complete set of printed ribs and bulkheads, a finished 14-inch propeller, gears and ready-formed hooks and shafts, Superlite balloon wheels and tailwheel, a very large tube of cement, 12 yards of brown Super Power rubber, rubber lubricant, silver tissue, tissue paste, dope, and plenty of spare balsa strip and sheet, plywood, celluloid sheet, and wire.

The fuselage is constructed of $\frac{1}{8}$ in. sheet formers and $\frac{1}{8}$ in. sq. longerons. The half-formers are cut out of balsa and cemented together, after which they are further strengthened by cementing $\frac{1}{8}$ in. sq. strips across the top and bottom. When all the formers are thus made ready, the fuselage is built up on a jig. Pieces of stiff card are cut out to correspond to the shape of the inside of the formers. These are temporarily attached with small pieces of gummed paper. The whole set of formers is then mounted in the correct position on to a strip of dowel and firmly cemented in place. When the longerons are cemented in place and are quite dry, the cardboard centres and dowel can be cut away and withdrawn, leaving a perfectly square fuselage. The fuselage was covered with silver tissue, and given three coats of tightening

dope. The result was a surprisingly light and strong body.

All the wing ribs are clearly printed on sheet balsa, and when cut out and assembled into two half-wings, are joined in the centre by four $\frac{1}{8}$ in. plywood fishplates cut to agree with the dihedral angle. The top surface, from the leading edge as far back as $\frac{1}{4}$ of the chord, is covered with $1/64$ in. sheet balsa. The gearcase is of the usual triple-gear type, and is fitted with a free-wheel device concealed by a small tin cowling immediately behind the propeller. Ball races are utilised to make the gears run smoothly and efficiently. The gearbox requires to be built up, but the only tools required are a small hand drill, files, and a soldering iron, for affixing the gearwheels to the shafts. (Super Scale Kits will supply a completely finished gearbox at a slight extra charge).

Altogether, I found the AW-6 a model as simple and interesting to build up from this kit as any I have built.

As to flying the model, I had considerable success. It has a good flat glide, and is a stable flyer. The length of fuselage, and the triple gears, combine to give a motor run of over a minute. With 850 turns on the motor the model will R.O.G. and fly for a good 40 seconds. As maximum turns are more than double above figures, flights of from 90 to 120 seconds can be obtained.

The model is a fairly fast flyer, and to hear the slight "drone" from the gearbox running at speed as the model takes off is a real pleasure. I found the AW-6 easy to trim, and obtained several 85—90 second flights with it, the day being calm and sunny, but certainly devoid of thermals!

With a span of 41 in. the AW-6 cannot be called a "pocket" model; yet when dismantled it takes up little space. It is a well-designed 'plane, strong enough to take rough treatment, and one that I can thoroughly recommend to readers to build. As to the kit produced by Super Scale Kits, I consider it well put out, and very fair value for the price asked.

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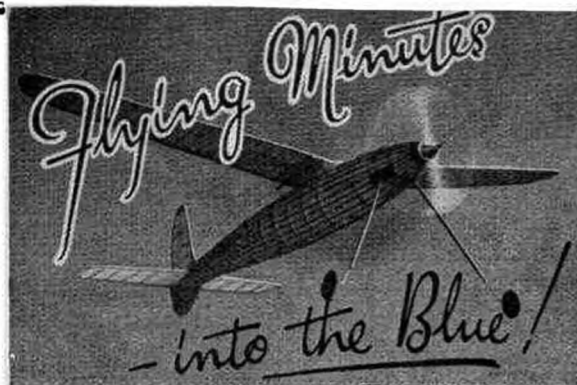
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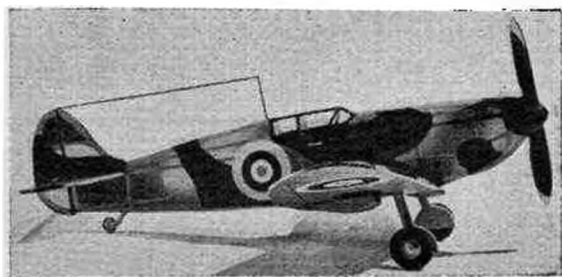
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AEROFOIL SECTIONS IV

By J. W. B. CRUICKSHANK

IN previous articles in this series I have confined myself namely to the forces acting on an aerofoil, that is lift and drag. So far I have made no mention of the movement coefficient, nor the point at which the forces of lift and drag are assumed to act.

When one deals with the equilibrium of an aeroplane, one must know not only the magnitude of the forces acting on an aerofoil, but also the point at which these forces act. This point is known as the "centre of pressure."

The location of this point is derived from the moment of the lift and drag forces about some point. The moment was generally measured about the leading edge, but nowadays it is generally measured about the quarter-chord point or the aerodynamic centre. The aerodynamic centre is a point which varies with different aerofoils, but is generally in the region of the quarter-chord point.

We will consider the moment about the leading edge, and we can see from Fig. 1, that as the resultant R of the lift and drag forces acts at C , C is the centre of pressure, which we will assume is a distance x from the leading edge.

Now as α is the angle of attack of the aerofoil to the air-stream, and as R is normal to AB , then $R = L \cos \alpha + D \sin \alpha$.

Then M moment about

$$LE = R \times x$$

$$= x (L \cos \alpha + D \sin \alpha)$$

$$= x \left(CL \frac{P}{2} SV^2 \cos \alpha + CD \frac{P}{2} SV^2 \sin \alpha \right)$$

$$= x (CL \cos \alpha + CD \sin \alpha) \frac{P}{2} SV^2$$

Now let us call the chord of the aerofoil C , i.e. $AB = C$. Then dividing throughout by c :

$$\frac{M}{C} = \frac{x}{C} (CL \cos \alpha + CD \sin \alpha) \frac{P}{2} SV^2.$$

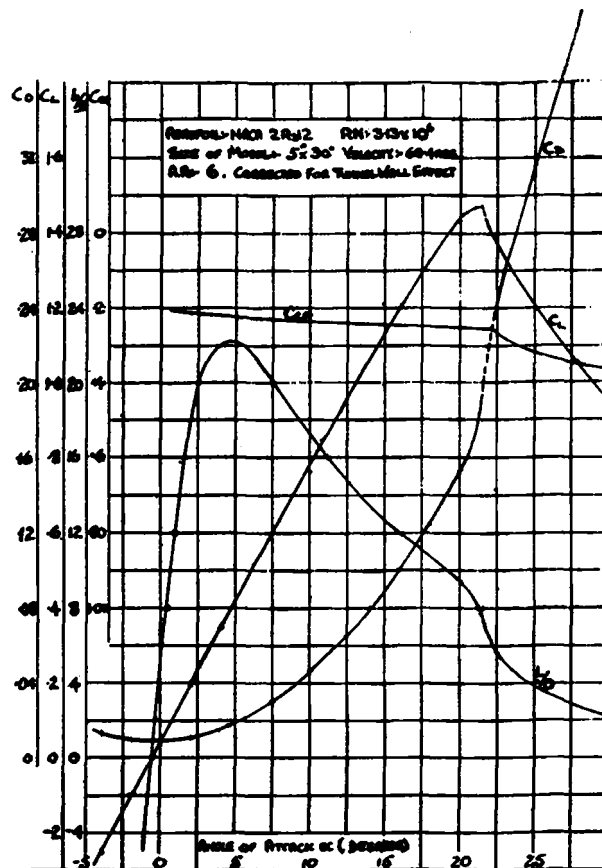
$$\therefore M = \frac{x}{C} (CL \cos \alpha + CD \sin \alpha) \frac{P}{2} c SV^2.$$

$$\text{Now if we call } \frac{x}{C} (CL \cos \alpha + CD \sin \alpha) = C_m.$$

$$\text{We get } M = C_m C \frac{P}{2} SV^2.$$

It will be noticed C_m is negative; this is due to the connection regarding the direction of the moment.

Now, as $\frac{x}{C}$ will give us the distance from the leading



edge of the C.P. in terms of the chord, we will call x C_{CP} , i.e. the centre of pressure coefficient.

Now

$$M = C_{CP} (CL \cos \alpha + CD \sin \alpha) c \frac{P}{2} SV^2.$$

$$\therefore C_{CP} = \frac{M}{(CL \cos \alpha + CD \sin \alpha) c \frac{P}{2} SV^2}.$$

$$= \frac{C_m c \frac{P}{2} SV^2}{(CL \cos \alpha + CD \sin \alpha) c \frac{P}{2} SV^2}.$$

$$\therefore C_{CP} = \frac{C_m}{CL \cos \alpha + CD \sin \alpha}$$

i.e. neglecting the negative sign of C_m .

Now, since over the normal range of angles of attack of aerofoils $CD \sin \alpha$ is small compared with $CL \cos \alpha$, and since α is small, we can write α for $CL \cos \alpha$.

$$\text{Then } C_{CP} = -\frac{C_m}{CL} \text{ approx.}$$

Note the inclusion of the $-V^0$ sign to counteract the $-V^0$ sign of C_m and using $C_{CP} + V^0$.

In America $(CL \cos \alpha + CD \sin \alpha)$ is usually written as C_N .

Then when the moment coefficient is given about the quarter-chord point

$$C_{CP} = 0.25 - \frac{C_m}{C_N}$$

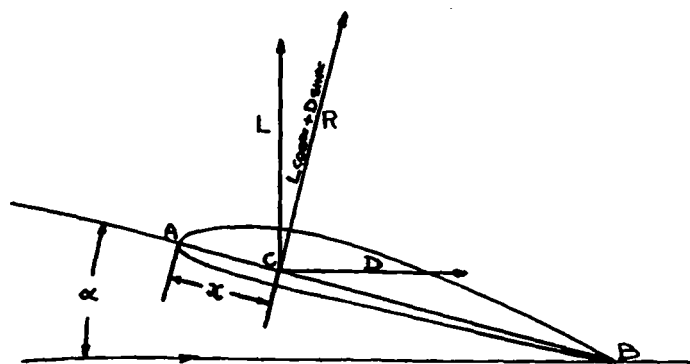


FIG 1

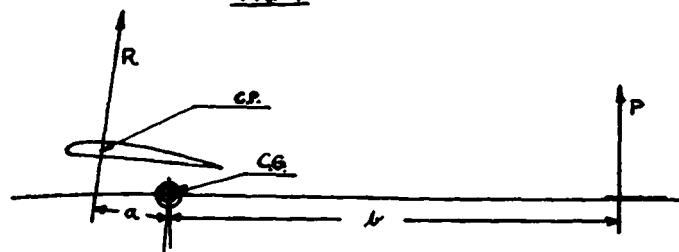


FIG 2

and when the moment coefficient is given about the aerodynamic centre

$$CCP = A - \frac{C_m}{C_N}$$

where A is the aerodynamic centre.

Unfortunately, the C.P. is not fixed throughout the range of angles of attack, but has a quite considerable movement. It moves forward up to the critical angle, that is the stalling angle, and after the critical angle moves very rapidly backwards. This rearwards movement is the cause of the nose-dive after the stall.

The moment coefficient at zero lift is generally written C_{m0} , and does not become zero at $CL=D$ except with symmetrical sections.

When the centre line of an aerofoil is a circular arc, $C_{m0} = -\pi\delta$ when δ = camber of the centre line and it is found that

$$C_m = -0.25 + C_{m0}$$

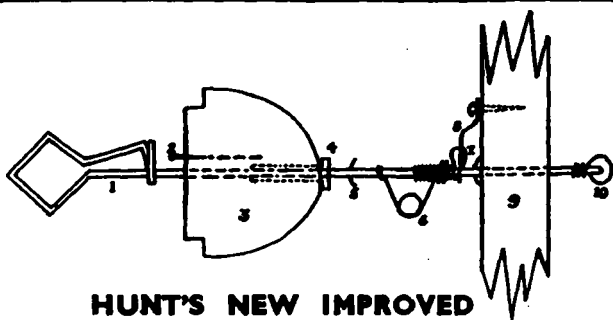
$$\therefore CCP = 0.25 - \frac{C_{m0}}{C_L} \text{ (taking } C_m \text{ about LE).}$$

From this equation it will be noticed that if C_{m0} is small the centre of pressure moment will be small, which is all to the good as far as the stability of the aeroplane is concerned. The ideal condition would be $C_{m0}=0$ which would ensure C_m remaining fixed. It has been found that by giving the centre line of an aerofoil an

(Continued at foot of next page).

CO-EFFICIENTS VALUES RELATE TO AR 6.

R.A.F. 33.					R.A.F. 34.					CLARK Y.H.					N.A.C.A. 2 R ₁₂ .				
A°	CL	CD	CCP	L/D	A°	CL	CD	CM	L/D	A°	CL	CD	CM	L/D	A°	CL	CD	CCP	L/D
-3.2	-0.40	0.220	—	—	-4.7	-0.27	0.18	-0.108	-15.0	-5.8	-0.256	0.192	-0.394	—	-2.5	-0.146	0.100	—	-14.6
-1.1	+0.98	0.176	0.432	5.6	-2.6	-0.12	0.132	-0.092	-9.1	-3.7	-0.05	0.142	-0.356	-3.5	-0.6	0	0.087	—	0
-0.3	—	0.176	—	—	-0.5	+0.22	0.122	-0.052	+1.80	-1.6	+0.94	0.132	-0.322	+7.1	0	+0.45	0.094	—	4.8
+0.8	0.242	0.186	0.316	13.0	+1.5	0.172	0.128	+0.028	13.4	+1.5	0.328	0.172	-0.280	19.1	+2	0.200	0.111	0.211	18
2.8	0.388	0.228	0.286	17.0	3.5	0.354	0.188	-0.090	18.8	4.5	0.574	0.306	-0.350	18.8	4.5	0.38	0.171	0.22	22.2
4.8	0.588	0.336	0.295	17.5	5.6	0.522	0.290	-0.14	18.0	6.6	0.702	0.414	-0.298	17.0	6	0.50	0.232	0.226	21.6
6.7	0.744	0.446	0.290	16.7	7.6	0.654	0.378	-0.094	17.4	8.7	0.830	0.548	-0.246	15.2	8	0.64	0.33	0.23	19.4
10.5	1.032	0.736	0.281	14.0	9.7	0.782	0.516	-0.068	15.1	10.7	0.958	0.698	-0.186	13.7	10	0.78	0.453	0.238	17.2
14.4	1.226	1.080	0.274	11.3	11.7	0.894	0.680	-0.01	13.1	12.8	1.052	0.860	-0.114	12.3	12	0.925	0.609	0.24	15.2
16.3	1.234	1.340	0.279	9.2	13.8	0.944	0.836	+0.058	11.3	14.9	1.116	1.054	-0.084	10.6	14	1.066	0.794	0.243	13.4
18.1	1.196	1.64	0.288	7.3	15.9	0.974	1.06	+0.032	9.2	16.0	1.116	1.242	-0.148	9.0	16	1.204	1.003	0.249	12.0
19.9	1.158	—	—	—	18.2	0.734	2.324	-0.672	3.2	17.0	1.096	1.540	-0.280	7.1	18	1.325	1.228	0.25	10.8
22.0	1.122	—	—	—	20.4	0.652	2.716	-0.774	2.4	19.3	1.026	1.920	-0.460	5.3	20	1.40	1.49	0.255	9.4
					22.5	0.628	3.00	-0.808	2.1	21.5	0.964	2.278	-0.586	4.2	21.5	1.47	1.935	0.258	7.6
					24.8	0.610	3.40	-0.714	—	24.9	0.674	3.486	-0.942	1.9	25	1.205	3.17	0.32	3.8
					27.0	0.622	3.68	-0.772	—	28.0	0.70	4.178	-1.064	—	27.5	1.07	3.69	0.35	2.9
					29.0	0.648	4.12	-0.824	—										



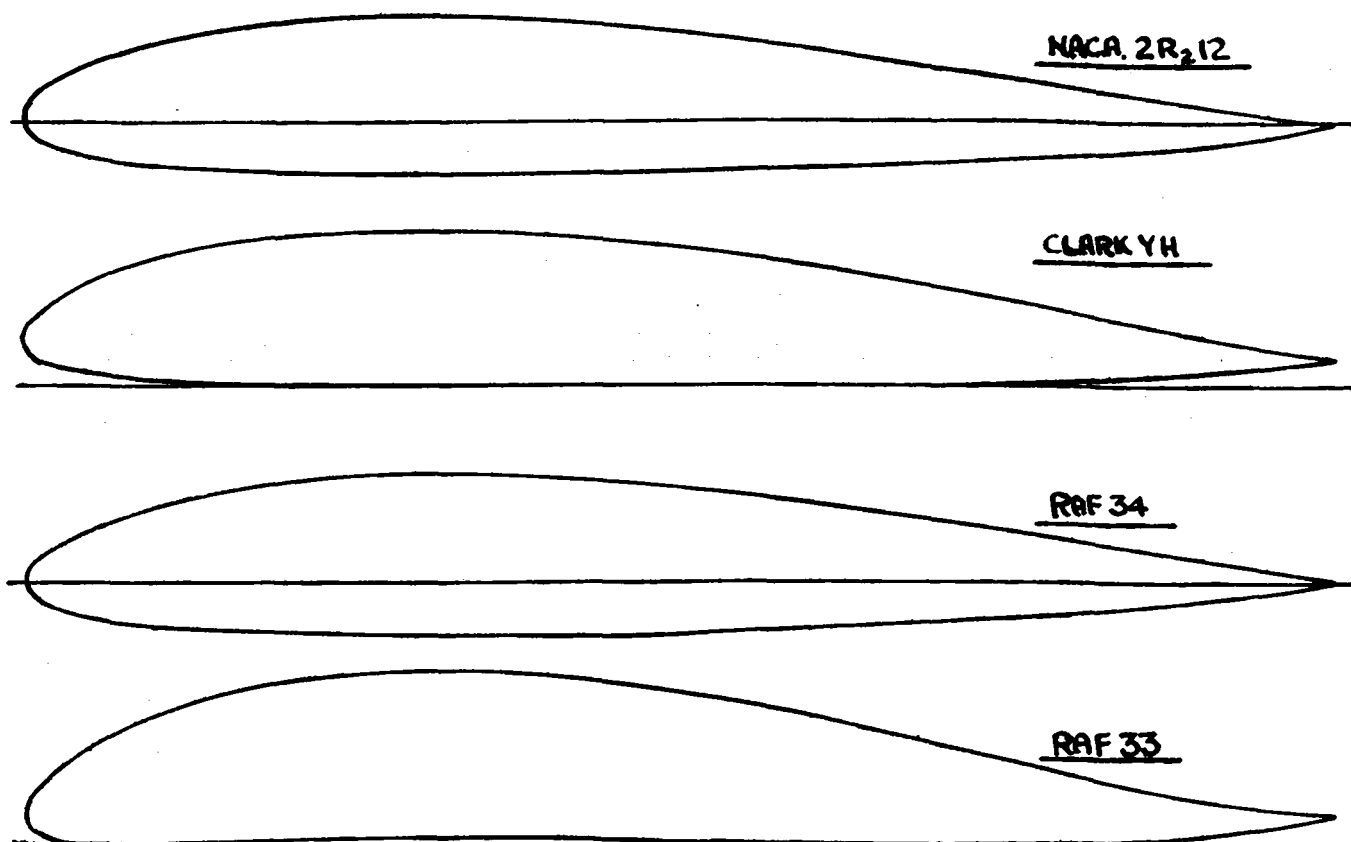
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PROFILE CO-ORDINATES IN PER CENTAGE OF CHORD.

Distance from L.E.	R.A.F. 33.		R.A.F. 34.		CLARK Y.H.		N.A.C.A. 2R ₂ 12.	
	Upper surface.	Lower surface.	Upper.	Lower.	Upper	Lower.	Upper	Lower.
0	2.14	2.14	0	0	3.50	3.50	0	0
1.25	4.42	.64	1.97	-1.63	5.45	1.93	2.30	-1.52
2.5	5.54	.28	2.83	-2.14	6.50	1.47	3.16	-2.10
5	7.18	.08	4.11	-2.81	7.90	.93	4.38	-2.76
7.5	—	—	5.05	-3.23	8.85	.63	5.29	-3.17
10	9.62	.08	5.82	-3.53	9.60	.42	5.98	-3.42
15	11.28	.20	6.98	-3.91	10.68	.15	6.97	-3.74
20	12.30	.34	7.72	-4.16	11.36	.03	7.58	-3.90
30	13.22	.58	8.38	-4.33	11.70	0	8.00	-4.00
40	12.94	.50	8.08	-4.33	11.40	0	7.63	-3.98
50	11.66	.26	7.22	-4.11	10.51	0	6.73	-3.87
60	9.70	.08	5.88	-3.69	9.15	0	5.49	-3.46
70	7.50	.04	4.31	-3.09	7.42	.06	4.06	-3.27
80	5.30	.24	2.70	-2.30	5.62	.38	2.61	-2.64
90	3.50	.96	1.26	-1.34	3.84	1.02	1.26	-1.63
95	2.86	1.48	.64	.76	2.93	1.46	.66	-.95
100	2.38	2.38	0	0	2.05	1.85	0	0

upward curve near the trailing edge, C_{mo} is small and does away with large C.P. movement. This reflex trailing edge reduces the value CL_{max} but practically fixes the C.P. The four aerofoil sections shown have reflex trailing edges and values of C_{cp} or C_m are given.

It is interesting to compare RAF 33 and RAF 82 (given in the previous article) as they are both developed from RAF 80 and have the same maximum camber of the centre line (0.05).

The importance of C.P. movement can be seen from Fig. 2. R is resultant force on the wing, and P the resultant force on the tail-plane.

Neglecting the other forces acting on the aircraft, for equilibrium:—

$$R_{xa} = P_{xb}$$

If the angle of attack is increased, R and P increase almost proportionately, but if the C.P. moves forward an appreciable amount

$$R_{xa} > P_{xb}$$

and we will have an unbalanced system which may lead to a stall.

It is usual to place the centre of gravity of the air-

(Concluded at top of next page).

craft near the C.P.. If the C.P. is aft the C.G. the same state of affairs will occur.

NOTE.—In No 2 of this series of articles a slight mistake and an omission were made.

Equation 1 on page 286 :

$$CL = 2\pi\alpha$$

where π is angle of attack in radians should read, where α is angle of attack in radians.

And equation 2 on page 286 :

$$CL = [0.1097 - 0.070 (\frac{c}{c})]\alpha.$$

A note should have been added to say α is expressed in degrees, and in both equations 1 and 2 α is measured from the angle of zero lift.

CLUB ACCOUNTS

“DIGANOS”

WHEN one considers the number of clubs which have been formed in this country during the last few years, and the amount of money in the funds of all these clubs, it will be seen that some efficient system of keeping the various club accounts is imperative.

Not every club has among its members some person with a sufficient knowledge of book-keeping to carry out efficiently the responsible duties of treasurer, nor has it the necessary members who can audit the books at the year end, so it is firstly for those clubs that this article is written. The joint compilers of this article have had considerable experience in the running of model aero clubs, and have each held the positions of treasurer, auditor, and secretary.

TREASURER.

The treasurer's duty is not only to account for all moneys dealt with by simply making an entry in the cash book, which, although understood by him at the time, may be of little or no use to the auditor. Each entry should be precise, yet explanatory. The auditor should be able to thoroughly understand each and every individual item throughout the year, without having to resort to a visit to the treasurer to obtain explanations. A set of well-kept books is a thing to be proud of, as a well-constructed model, as each requires care and time in its own line. There are numerous systems of keeping accounts for a club, and a few examples are explained below.

CASH BOOKS.

1. Perhaps the simplest, as far as the treasurer's duties

balanced, the book will give simply the total funds in hand, but will not show the distinct amounts of cash in hand and cash in bank.

2. An improvement on the above is that whereby a similar book is used, the only difference being that the cash book has two columns on each side; one column for cash receipts, and one column for bank receipts on the left-hand side of the book; and one column for cash payments, and one column for bank payments (cheques), on the right-hand side of the book. As an item is received or paid it is entered in the column to which it belongs.

EXAMPLE:—January 1st: Balances in hand—Cash £8 - 5 - 0, bank £5. Received from G. Smith donation of 8s. January 2nd: Paid £8 from cash into bank (particular attention is drawn to this item as it is simply a transfer from the cash column to the bank column). Received from Trevor Jones a cheque for £1 - 1 - 0, as vice-president's subscription, this cheque being paid into bank immediately it was received. January 8rd: Paid from cash, postages on circulars of 8s. 6d. Paid by cheque, Aberystwyth Corporation, ground rent on clubroom, £2. The books should then be balanced.

8. For the treasurer with a further knowledge of book-keeping the following cash book should be of interest. The cash book has the usual cash and bank columns, for both receipts and payments, and, in addition, provides analysis columns for the items to be classified under their respective headings. This cash book is particularly recommended as it is of great assistance to the auditor, provided that it is well kept. As will be seen by those

Date	Receipts.	Cash			Bank			Date	Payments	Cash			Bank		
1939								1939							
Jan. 1	To Balances	3	5	0	5	0	0	Jan. 2	By Bank	3	0	0			
	„ G. Smith, Donation ..	0	3	0				Jan. 3	„ Postages on circulars	0	3	6			
2	„ Cash				3	0	0		„ Aberystwyth Corp'n. Ground Rent ..	0	4	6	2	0	0
	„ T. Jones, Subscription ..	3	8	0	9	1	0	7	„ Balances c.f. ..				7	1	0
Jan. 7	„ Balances		4	6	7	1	0			3	8	0	9	1	0

are concerned, is that of the two-sided cash book. The left-hand side to be used for receipts, whilst the right-hand side is used for payments. All moneys received, whether received in cash, or received by cheque and paid into the club banking account, are entered on the receipts side of the cash book, and all payments, whether cash or by cheque, drawn on the club banking account, are entered on the payments side of the book. When

readers who understand such things, it also provides a good system of double entry. When adopting this method and making, say, a payment from the funds, the treasurer should enter in the cash column (or the bank column, if the payment is made by cheque), the amount paid, and he should also insert the figure in one (and one only) of the analysis columns to which the transaction refers. Following is another example:—

March 1st: Paid by cash, postages, 8s. 6d.
 March 2nd: Inserted into electricity meter in club-room, 2s.
 March 2nd: Received vice-president's subscription of £2 - 2 - 0.
 March 4th: Paid printer for programmes and sundries, £8, by cheque drawn on club's bank.

page should represent a week, and should be divided into three columns: the first headed "subscriptions due"; the second headed "paid"; and the third "arrears." If possible, the treasurer should fix some specific evening for the collection of weekly subscriptions. He should book down all his figures in the subscription book as he receives the amounts. He should

Date		Cash	Bank	Weekly Sub- scrpsns.	Dona- tions, etc.	Sundry Re- ceipts	Date		Cash	Bank	Post- ages	Print- ing and Station- ery	Heat and Light
1939							1939						
Mar. 1	To Balces. in hand	6 3	4 16 0				Mar. 1	By Postages ..	3 6		3 6		
" 2	" Vice-Presdt.	2 2 0			2 2 0		" 2	" Electricity ..	2 0				2 0
" 5	" Members' Sube	4 6		4 6			" 4	" B. Lot, Printer		3 0 0		3 0 0	
" 7	" N. Heybor ..	1 0 0				1 0 0	" 9	" Balances ..	8 7 3	1 16 0			
" 9	" Dance Profits	5 0 0				5 0 0							
		8 12 9	4 16 0						8 12 9	4 16 0			
Mar. 9	" Balces. in hand	8 7 3	1 16 0										
				These t	hree ana	lysis					These	three ana	lysis
				columns	totalled	at the					column	ns totalled	ed at
				ye	ar end.						the y	ear end.	

March 5th : Received weekly subscriptions from members, 4s. 6d.

March 7th: Received by cash £1 for services rendered by members in helping neighbour to erect A.R.P. shelter.

March 9th : Received cash profits on dance, £5.
Cash in hand, March 1st, 6s. 8d. In bank, £4 - 16 - 0.

Now with all the above types of cash book it will be seen that some check on the subscriptions due from members should be made. The type of book advised for this purpose is one which is sufficiently long to accommodate all the members' names, and it need not be very wide. It should be possible to write on the inside of the two covers of the book. All the pages in the book should be cut so that their width is about $1\frac{1}{2}$ inches less than that of the outside covers. On the inside of the two covers, in the $1\frac{1}{2}$ inch extension over the other pages, should be inserted the names of all the members of the club, one name to each line. When this is finished it should be possible to open the book at any page, and there be able to read the names on both the back and front.

Firstly, let us deal with weekly subscriptions. Each

then total the second column, which total (of subscriptions paid), should then be entered in the cash book. He will then transfer his arrears to the next page, where they will be added to the next week's subscriptions, and entered in the subscriptions due column. Where a few members pay quarterly, the quarter's subscription should be entered in the paid column of the current week, and transferred with the total to the cash book. The next twelve weeks in the subscription book, for that particular person, should then have marked in the first column "nil."


With regard to quarterly or annual subscriptions only, a similar book may be used for these, but it may be as well to enter each individual subscription received in the cash book. It should also be marked in the subscriptions book, which will show at any time those members who are in arrear.

Provided the books are kept orderly, and the amounts are entered at the time the transaction takes place, there is no reason why any treasurer should waste precious time attempting to make a badly-kept set of books balance.

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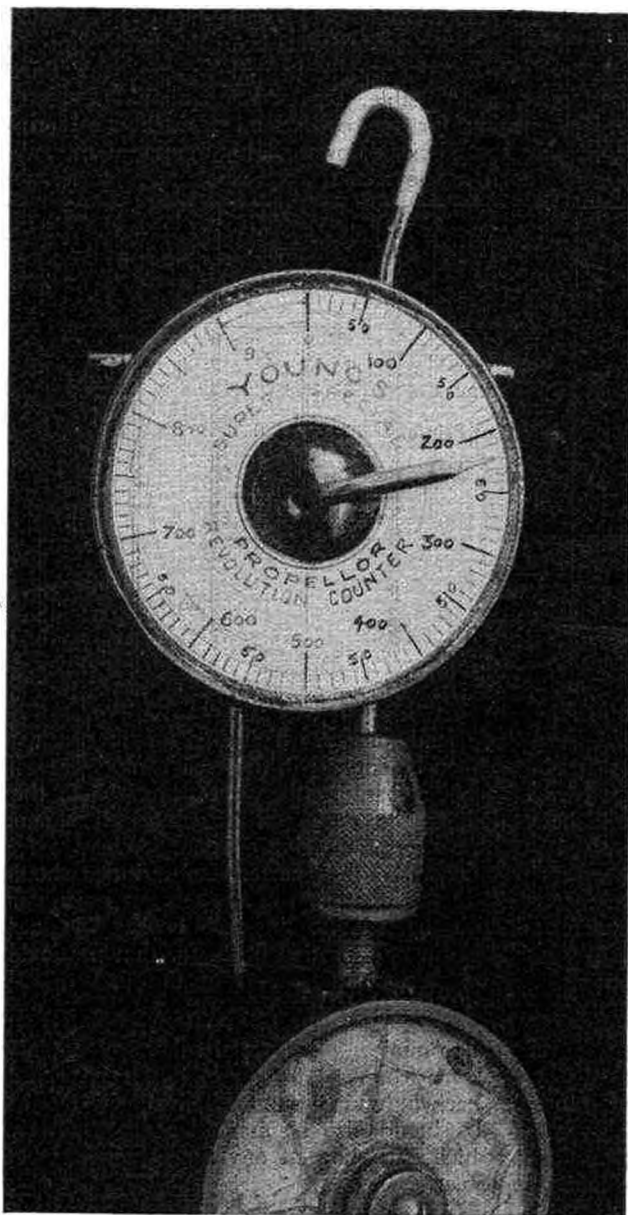
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You know the most interesting conversation always takes place while you're winding, and since you value both your friends and your rubber, it looks as though, sooner or later, one or the other has got to go, unless you get a rev. counter. Too expensive? Then make one. Too much trouble—not at all. Some Meccano parts and a tooth powder tin, and you needn't even solder unless you want to. The cost is around 1s. 6d. to 2s., with the tooth powder thrown in. It is dead accurate, counts up to 950, and has a zero setting for use at will.

The illustration shows the counter attached to the most popular winder in use to-day. But one screw, apart from

A SIMPLY-MADE

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the winder jaws, holds it, so it can be adapted to fit any winder.

Get first the handsome- and professional-looking (when it's painted) case, the carbolic tooth powder tin. This one cost threepence, and measures 8 in. \times 1½ in. It must not be any smaller. The other parts required are Meccano rods, two 6 in. and two 8 in. long, two worm gears, one 19-tooth \times ¼ in. gear-wheel, and one 50-tooth gear-wheel and five collars.

Punch a hole in the dead centre of the top and the bottom of the tin. Do this with a spike which burrs the edges inwards; this makes a better bearing than a sharp-drilled hole.

Bend a 8 in. rod at right-angles in the middle, file one of its ends into what you think a smart pointer should look like. The other leg of the right-angle will henceforth be referred to as the centre shaft (P) and must be fitted in the holes just made. Use the bottom of the tin with its raised edges as the "face," and the lid as the "back" which is left removable for inspection.

Fit the 50-tooth gear (G4) to the centre shaft, bush first. Next comes shaft B, a 8 in. rod revolving in bearings burred inwards at points which can be judged visually. This is not as difficult as it seems, since there is a great deal of leeway provided by the fact that G4 need not mesh with G2 dead on its axis.

Thread on shaft B a collar C1, 19-tooth gear G3, worm gear G2, and collar C3.

Now the winding hook. A 6 in. rod has 8½ in. kept straight in the vice, while the rest is hammered into the hook. The worm G1 is threaded on, and again the tin case is punched to make bearings, this time through the lid-flange. It leaves only ⅛ in. of the tin outside of the bearings to hold the shaft, but it is enough. The lid will have to be nicked to fit over this, and a similar nick in the lid will have to be cut to fit over rod D, which fits parallel and similarly to rod A. Rod A, of course, revolves, held in position by collar C4, while rod D is fixed. Fixing can be done by soldering collar C2 to the tin and a dab of solder on the point where the rod goes through the tin. While the soldering-iron is hot, put a 5-hole Meccano strip behind the face with a dab of solder through its outer holes, to reinforce the rather weak tin.

If you are determined not to get the soldering-iron out, leave out this strip and substitute a threaded collar for the plain collar C2, fixing it to the tin with a screw into its end. You will then probably have to use threaded rod in place of plain rod D. Keep rod A at right-angles to rod B, and as a guide, the measurements between centres on mine are, rod A to centre shaft P, ⅞ in., P to D, ⅝ in. A piece of ½ in. tin strip folded over rod D, drilled to fit under a screw conveniently situated on the winder, holds the counter still when it wants to turn, and finishes the mechanism.

The worm gears revolve once to turn the flat gears one tooth, therefore the total reduction is one to $19 \times 50 = 950$. Stick a paper disc on the "face." If you know how to divide it into 9½ divisions, each representing 100, you

REVOLUTION COUNTER

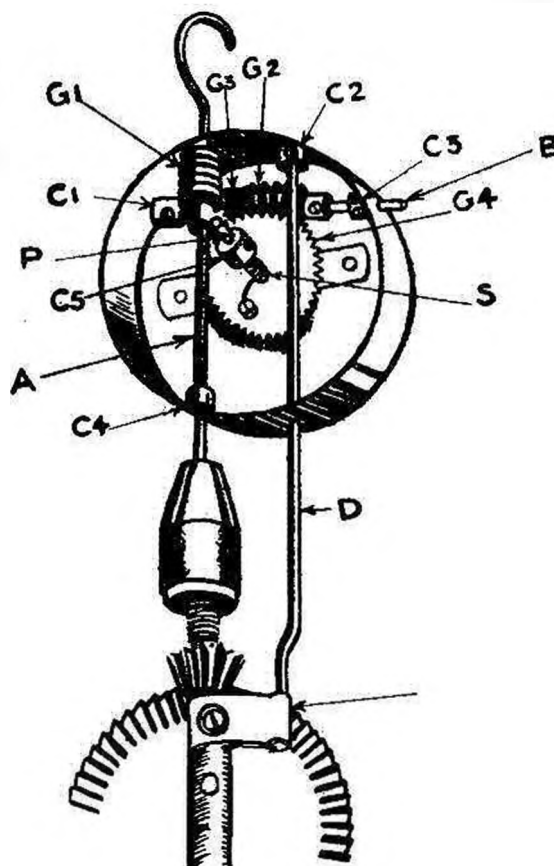
DOUGLAS YOUNG

can calibrate it accurately. If you don't, then start from 12 o'clock, wind 100, and make a mark, similarly all round.

The zer-resetting device is optional, but jolly well worth adding. It consists of spring "S." Don't get scared of making a spring on the score of not being a metalurgist. Heat treatment is not necessary. I made this one by unwinding a Meccano spring to get a few inches of straight wire, then winding it round a piece of wire somewhat smaller than the rod, for about six or eight turns. It springs out to a size which grips the centre shaft tightly. When the lower end is secured beneath a screw and nut put through a hole in wheel G4, it allows the pointer to be turned by hand clockwise, but not anti-clockwise. The top end is left free, and collar C5 is to stop the spring riding up. Start the spring from the bottom, coming up clockwise.

You turn the pointer clockwise to zero by hand, after each wind, yet when winding, the pointer positively registers without slip or springiness.

Coloured aero dope finishes the metal, and put plenty of transparent dope on the paper face. Everybody will want to borrow it as soon as you bring it out, so put a clockwise arrow on the face to show which way to set it to zero.



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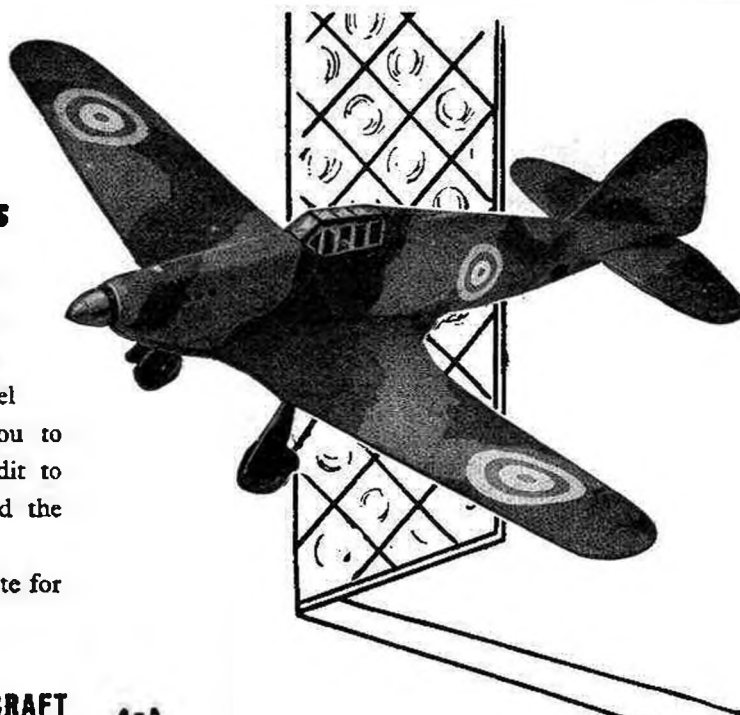
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TESTING PET

By J. C. SMITH, Ho

to be impracticable; seldom do we experience a day of sufficient calm for the use of a pylon. It was tried, but proved disastrous. Half a turn against the wind and the model climbed fiercely, but the other half, down wind, ended in a still more fierce dive, under power, to . . . ! ! Experiments with a rubber shock cord, and also with a fishing rod in place of the cord, were tried in turn. Result, similar failures. And so the writer tried a method using a human pylon. This has proved most successful.

A VEXED question to be sure. During a period as registration secretary for petrol models for the S.M.A.E. the writer has developed a certain sense of understanding for the hundreds, maybe thousands, of gas enthusiasts with models to fly and no ground on which to test them. Hence this article.

Grateful acknowledgment is made to Mr. E. Ross, of the Northern Heights Model Flying Club, for his ready help in experiments.

It must be clearly understood that the following does *not* in any way remove the necessity for fully insuring and registering your models, but is offered to fill a big gap which exists in the ever-growing "petrol world" for testing in flight that new model on which you've spent so much time and not a little money.

Most of you will know all about Mr. Bullock's Pole method for indoor flying, and, as is natural, that appeared to offer possibilities. An attempt was made by Mr. Ross, but the stationary pole method was proved

strengthened to take the excessive side pull, the tethering cord being attached to the wing-tip just in front of the centre of pressure (gravity) of the model. A kind of bridle is also carried back from that point to the extreme rear and to the extreme front of the fuselage, where they are securely attached. These two safety cords should be attached to the main tethering cord and not to the wing-tip, as they come into use in the event of the wing-tip breaking or pulling through the structure. Strong bamboo outlines well glued to the leading and trailing edges, also to the main spar, are recommended. The wing, too, must be firmly—very firmly—attached to the fuselage.

Incidentally, it is not advisable to use this method of testing for models having an engine of more than 6 cc. capacity.

A strong waterproofed sea-fishing line, which can be obtained at the chain stores, is suitable for use as a cord.

The cord, attached as explained, is best used from a

"ROUND the Pylon" contests have come to stay. The steady, silent flights and regular good landings, and the fact that it is possible to obtain durations upwards of two minutes without walking more than half a dozen yards to retrieve the model makes this kind of flying unique.

I went to one of the first indoor meetings of the Lancashire Model Aircraft Society last winter, and although no competitions were run and nobody had any intention of breaking records, a good night's fun was had. The models used were all revamped and lightened outdoor jobs, and somewhat fast; indeed, one fellow arrived with a medium weight outdoor model powered by about 14 strands of rubber, and when it was flying I am not ashamed to say that I kept well out of range. The flights obtained were mostly about 45/60 seconds, except for the irrepressible Rushy, who had begged, borrowed or purloined a specially built Pylon flyer made by a member, I believe, of the Blackheath Club, and who succeeded in making flights of about 75/80 seconds.

I had an opportunity of examining this model, and found it to be about 80 inches span, elliptical wing, square

"PYLON FLYING MODE

fuselage, and set on edge, making it a diamond shape, and for power it used six strands of $\frac{3}{16}$ in. flat rubber. compared with the models produced later it was rather fast flying but very steady and consistent.

On arriving home that night I delved into the usual source of indoor information—Zaic's Year Books—and after studying all the indoor designs, set about a pylon flyer for my own use.

Here I would mention that in this article it is not my intention to state just how pylon models should be built and flown, but rather to put down in words my own experiences as taken from notes which I made at the time, so that the reader will know roughly the problems he is likely to encounter.

I made my first error at the very outset. I knew that a free-flying contest was to be run later in the season, and I decided that if I built my model light enough and made the undercarriage detachable I would be able to enter. Later events proved that a pylon flyer is a very

ROL MODELS

on. Comp. Sec. S.M.A.E.

fishing reel, held in the hand, from which it can be slowly paid out. But be safe rather than sorry; have a cord too thick rather than too thin.

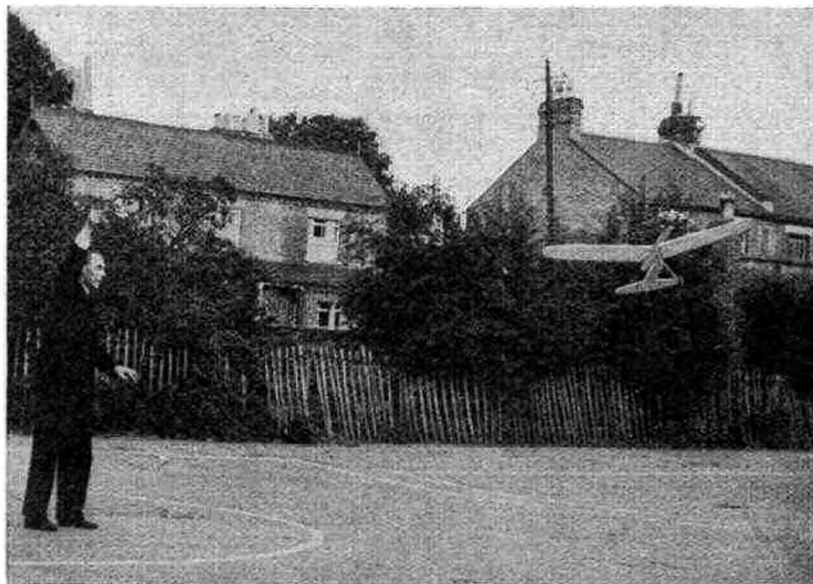
The procedure for flying is very simple, and easily mastered.

A public ground should not be used, as, in such circumstances, sufficient control of crowds cannot be exercised.

A circle of at least 15 feet radius is necessary. Having started the engine and throttled it down to a speed just enough to fly the model, the wing-tip to which the cord is attached is held, and the model flung out and round until it is air-borne. The line is then lengthened until the limit of space is almost reached. For the first one or two turns it is desirable to turn with the cord and model until sure that all is well, and that even flight is being maintained. Even a slight wind will cause a climb when flown against, and so the operator should step back slightly, at the same time pulling gently on the cord, thus pulling the nose of the machine down. With the wind the tendency will be to dive, which can, to a degree, be corrected by speeding up the flight by pulling on the cord in an upward direction. A few trial runs, and the knack is acquired.

The performer gets a trifle giddy after a turn or two, so, facing the danger side of the circle, or that around which the model travels down wind, the cord can be swung over and behind the head.

The time-switch should be set for about 15 seconds—no longer—at least until a deal of practise has been gone through.



When the time-switch cuts, a slow glide is maintained by swinging the machine on the end of the cord and bringing in to a gentle landing.

There may be many "buts" and "ifs" about this method of testing, and it is not offered as a solution of the ground difficulty, but it has a certain fascination and at least the germ of an idea for coupling up control surfaces!

If used in isolated surroundings and with careful attention to the reinforcing of the model's structure, careful attachments of the cords, careful choice of a suitable strong cord, and in winds of not more than 10 miles an hour; it will be found to be, at least, a partial solution of the biggest difficulty to-day, that of journeying to the few grounds big enough and suitable for free flying of petrol models.

Use the method with care, extreme care, and there is no reason why you should not test-fly your petrol model in the garden!

EL AIRCRAFT" By H. McDougall

specialised type of model and cannot be combined with any other kind. But more of that anon.

The model as it was eventually completed had a fuselage about a foot long and wingspan of a little under 30 inches. The tail was mounted on a balsa boom, and an underslung fin was used in the American manner. The undercarriage consisted of two simple thin bamboo legs with an attachment at the top which could be clipped to the sides of the fuselage by rubber bands. The fuselage being set on edge, it was necessary to mount the wing on balsa struts, but this, while being just a little tricky in assembly, presented no particularly great difficulties.

The propeller, which was roughly a third of the wingspan in diameter, was cut from $\frac{3}{4}$ in. sheet balsa and steamed to shape, and the completed model was covered with superfine tissue, except the underside of the wing and tail-plane, which were left uncovered.

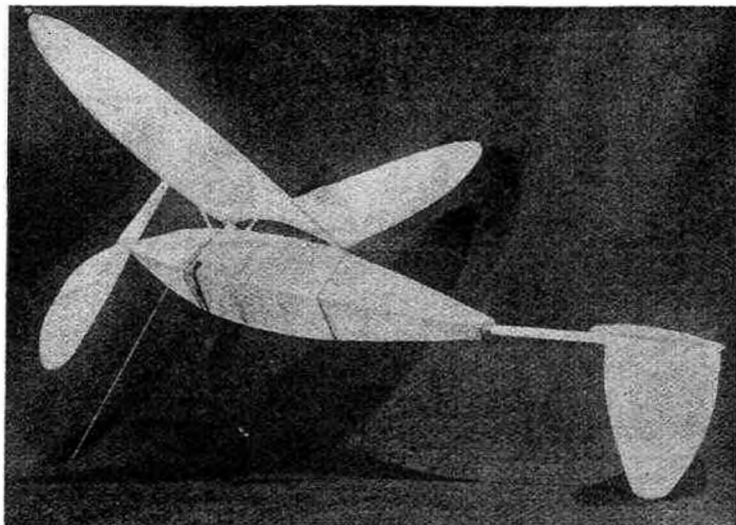
At the next meeting I arrived with this model, and took along several skeins of rubber of varying lengths and

numbers of strands, and also a few spare propellers of various diameters.

Having assembled the model and powered it with four strands of $\frac{1}{8}$ in. flat rubber, I tried gliding tests, and found that owing to its light weight it literally floated through the air, and touched down very gently.

I then decided to try a power flight, and came against the first snag. When prewinding I had never had very many turns on the rubber, and I found that when the turns were past the 500 mark the rubber bunched to such an extent that it was difficult to pass it through the nose former without jamming. With a little coaxing, however, I eventually got it wound, and tried a power flight without the line, as I reasoned that the small size of the model would enable it to circle quite easily, which surmise proved to be correct, for the model floated around gently for about 30 seconds. The minor adjustments were not difficult to make, small chips of balsa under the leading edge wing support giving the necessary incidence, while the removable tail block allowed easy adjustment of the tail-plane in the usual manner.

Having got the model making regular flights of about



a minute, I began to feel quite elated, although I noticed that when it landed there were still a few turns left on the rubber. This led me to believe that the power was too low, so I tried five and then six strands, that this increased the difficulties of getting the bunched rubber through the nose former and also failed to improve the performance. I tried further flights, but still there was no improvement. Eventually I wound the model up to capacity and watched the propeller closely as the rubber unwound, and I then found the cause of the trouble. The propeller, which was of sheet balsa, twisted to shape in the ordinary manner, was rather pliable. Therefore when the increased power turned it round very fast the blades were not sufficiently rigid to retain their shape, with the result that they were forced to flatten out, and the propeller then acted like a fan.

This peculiar action could, of course, be overcome by using a carved propeller or one twisted from a stiffer grade of sheet balsa. As I had no time to substitute another propeller, however, I went back to the original four strands and concentrated on adjustment, and eventually was clocking 75 seconds fairly regularly.

By the time the next meeting came round I had repaired the damage and re-covered the fuselage, and this time I gave it a coat of diluted dope, this adding very little weight but strengthening it very considerably.

Immediately before the pylon competition was due to start I had a last flight on 950 turns, which I knew was somewhere near the maximum. The model flew beautifully, although, owing to the tightness of the circle, I had to lift the thread over the pylon at each circle. I noticed that the model flew in tighter circles when on the line than it did when flying freely, and this I adjudged was due to the slight extra weight of the thread and hook making the model one wing heavy. However, it clocked exactly 90 seconds, which I thought would be sufficient to place in the contest. Actually, when I flew it in the competition it refused to climb, and only recorded 79 seconds, placing third.

Defeated but undismayed, I tried the model afterwards and found that in

packing out the tail-block top stop the model circling too tightly I had inadvertently raised the tail boom slightly, and this is what had spoiled the climb.

The following points should be helpful to any pylon-flying enthusiast:—

Wing.—Elliptical shape preferably, although not necessarily.

Fuselage.—Should be flat-sided and used in the normal manner, and need not be set on edge. Should be normal length to permit fairly long skein of rubber. Nose former must be large enough to permit bunched rubber to pass through easily. Covering may be given thin coat of dope for strength.

Tail-plane.—Similar to wing. Slight lifting section. Construction as light as possible.

Fin.—Underslung type combined with tailskid. May be made flat from $\frac{1}{8}$ in. square balsa and covered on one side only.

Propeller.—Medium grade sheet balsa, suitably twisted if very light model is desired, otherwise normal hand-carved type from light block of balsa.

Power.— $\frac{1}{8}$ in. flat rubber about $1\frac{1}{2}$ times length of fuselage, and sufficiently powerful to give fairly strong initial climb and long enough to take at least 900 turns.

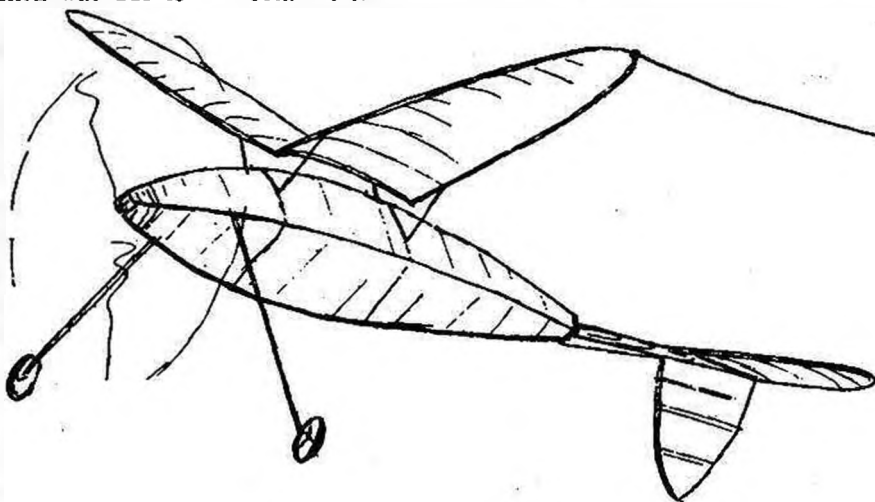
Undercarriage.—Lightness essential. Very tiny wheels quite good enough. May be single-legged if desired.

Flying.—The model should be lined up in a similar manner to an outdoor model, except that the lifting tail must be set at a negative angle. Less incidence is needed than on an outdoor model, as a long power run rather than great climb is the desirable feature.

The fin may be set to make the model pull slightly away from the pylon, so that it flies at the full extent of the line.

Gliding tests should be made first in the usual manner, but too much attention need not be given to obtaining a perfect glide. It must be remembered that even in the largest halls, excluding, of course, the Albert Hall, the model will only take five or six seconds to touch down after the power has gone. Therefore the important part of the flight is immediately after the initial burst of power has sent the model to the top of the room and it has settled down to its regular cruising speed, and it is at this part of the flight that correct adjustments are essential.

I have no doubt that when a little more experience has been gained in the building and flying of these intriguing little models, flights of upwards of three minutes will be obtainable.



THE MILES "MAGISTER"

How to make a Solid Model, scale $\frac{1}{4}$ ————— By S. A. LINSTEAD

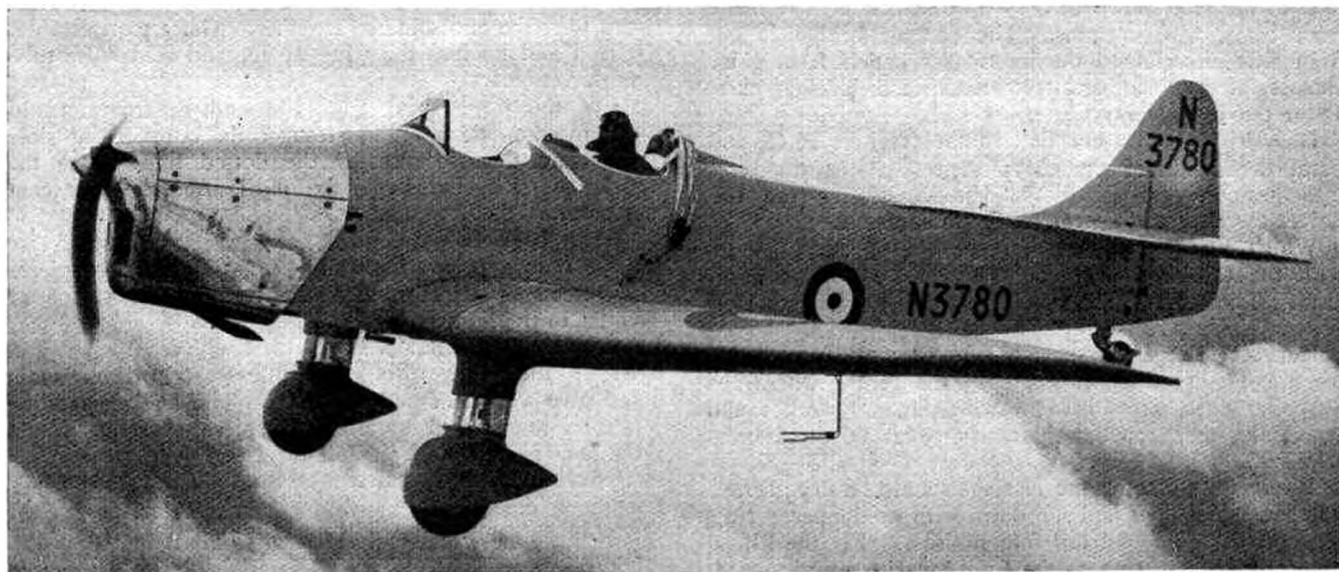


Photo courtesy Editor of "Flight."

FOR the first of this series, its writer has chosen what he considers a simple machine, which should appeal to the beginner and to the advanced modeller. The lines are simple and pleasing, the design is clean, and the details are not too numerous.

Before going further, the writer would like to thank Messrs. Phillips and Powis Aircraft (Reading) Ltd. for granting permission to publish details of their machine.

The Miles Magister is a two-seat, low-wing monoplane, of wooden construction, designed and equipped with dual controls and instruments for *abinitio* and advanced training. The aeroplane can be flown solo from either cockpit, normally the instructor occupies the front cockpit.

Large numbers of this machine have been supplied and are being constructed for the Air Forces of this and other countries for training purposes.

The fuselage, built-up on four spruce longerons, spaced out by inter-struts, and plywood covered

The wing is built-up on two box spars and covered with plywood. Inspection panels are provided to aid construction and maintenance. The tail-plane, fin and rudder are framed up and fabric-covered. The undercarriage consists of two Lockheed oleo airdraulic legs, to which are attached light alloy forged forks. The wheels are fitted with low-pressure tyres and Bendix brakes.

PERFORMANCE.

Maximum speed	145 m.p.h.
Cruising speed	125 "
Landing speed	45 "
Maximum ceiling	23,000 ft.
Service ceiling	18,000 "
Rate of climb at sea-level ...	850 ft. per min.
Weight fully-loaded	1,825 lb.

MAKING THE MODEL.

The fuselage is made in two halves, the advantage of

this method is that equal sections can be made on either side, and that the cockpits can be hollowed out.

Trace Fig 1 on a piece of $\frac{1}{4}$ in. plywood, thus making a template. Do the same with Figs. 2 and 3, a, b, c and d. Draw two centre lines along the 8 in. \times 8 $\frac{1}{2}$ in. block, about $\frac{1}{8}$ in. from the outsides, place the template figure and trace round them, cut out with a fret or keyhole saw. Bore two $\frac{1}{2}$ in. holes right through the two halves EE, so that they form one block. Run the plane round the edges so that both are equal, make sure that the bottom is square with the side. Pull apart and hollow-out the cockpits, shown on the dotted line, using the template 3a. Now shape each half to template 2, then round off its decking to Figs. 3b, c and d. Don't take too much off before checking with template at each station, and do not attempt to cut out the cockpit openings at present.

The wing figure is cut from a piece of half inch stuff. Mark out the outline and the details a, b, c, d and e. Cut out and try for fit on the fuselage. Cut out the slots AA, these are for the undercarriage, then turn to BB; these are recessed $\frac{1}{10}$ in. deep, make two brass plates to fit but don't fix yet. Drill small holes in the corners of CC, so that you don't lose your mark when shaping its wing. Turn the wing over and plane down the centre section to $\frac{1}{8}$ in., then taper off from the centre section to the tips, which should be about $\frac{1}{8}$ in. Turn over again and make two saw cuts DD, nearly through. Clamp the wing to the bench at the centre section, pack under the tips, and round off to the section shown. Put more packing under and get the dihedral angle, then screw into position the plates BB, and fill up the cavity with plastic wood. Now shape the under side.

THE UNDERCARRIAGE, FIG. 5.

Cut off two of 5a from $\frac{1}{8}$ in. plywood and try for fit into Fig. 4a. Cut off four of 4b and glue to A. When dry shape off to section shown. Cut the wheels

4c from the same as A, sandpaper down to make a running fit.

THE SEATS, ETC., FIG. 6.

The backs, 6a, are cut from $\frac{1}{8}$ in. ply, and the seats, 6b, from $\frac{1}{4}$ in. stuff, bend the back round, glue and tack to the seat shown at 6c. Two sticks, D, are made from brass wire or pins. The cockpit bridge is cut from $\frac{1}{8}$ in. wood, and the instrument panels from $\frac{1}{8}$ in. ebonite, if you can get it, if not, wood blacked over. Paint the instruments white.

Glue Fig. 6c into one half of the fuselage at C, and paint the inside of the cockpits grey. Glue the seats into position and fix the sticks. Now glue the two halves together so that the seats are enclosed.

Whilst you are waiting for the glue to dry, get on with the tail unit, Fig. 7. These are cut from $\frac{1}{8}$ in. stuff. The control horns, D, should be left till the model is nearly finished.

Cut and shape the nose-block, Fig. 8, from $\frac{1}{4}$ in. wood. To get a good shape in the centre where the propeller goes, press in a drawing-pin and work round it. Make the propeller-shaft, shown at 8d from brass wire.

By now the glue on the fuselage should be dry; scrape off the surplus stuff and rub down with sandpaper. Now glue up the wing and tail into position. Fix the fillets, 4e, and fair the wing to the fuselage with plastic wood, and the same with the tail.

Fit the undercarriage, and check over the wing-tips for height. If one side is a bit high file a bit off the shoulder of the undercarriage leg, 5a and 5b. Glue into position and fair off.

Now you can cut out the cockpit openings, XX.

Carve out the propeller, Fig. 9, from $\frac{1}{4}$ in. wood. A point to remember is that Gipsy engines turn clockwise, so the leading edge should be on the right-hand side, looking at the topmost one.

Cut out the cowlings, Fig. 10, a and b, from aluminium foil. The air scoop x is on the starboard side only. To make this scoop, cut a little slit in the panel with the tip of a pen-knife, make a little hard-wood punch to shape, round off the end. Place the punch in the position of x and give one sharp, light tap with a hammer. Try the panels for fit, but don't fix.

The tail wheel and castor, Fig. 11, can be made from

scrap, cut out the castor from brass strip and bend at the dotted lines. The stem is made from $\frac{1}{8}$ in. brass screw with the head cut off, and soldered into position. Cut the wheel from a piece of scrap $\frac{1}{8}$ in. plywood. Assemble and fix into position.

The petrol tube, Fig. 12, can be made from two pins, bent to shape and soldered together. Get a paper staple, rebend and fix into the wing at 4e, and solder the tube into position.

Cut the windscreen, Fig. 13a and b, from an old camera film, clean up in strong soda water. Cut slots to receive them, shown by the dotted lines above the cockpits. Fit, but don't fix, until after the first coat of paint.

Turn back to the control horns, Fig. 7d, which are made from a piece of ply or brass. Thread two pieces of thread or wire through the fuselage, and glue or solder to the horns.

Give the whole model a rub down with sandpaper, and fill up the grain with wood filler. Rub down again and give a coat of under-coating. The leather padding can be represented by gluing a piece of string round the inside of the cockpit and varnished over.

Fix into position the windscreens and give the whole model a coat of chrome-yellow. When dry, fix on the nose-block and paint silver, fix the propeller, and, finally, fix the cowlings. The best representations of studs, the writer has found for this purpose, are small dolls' pins.

Paint the cockcades red inside, blue outside, and the numbering black. The propeller boss grey and the blades are clear-varnished, the spinner silver.

LIST OF MATERIALS.

- 1 piece 12 in. x 8 in. x $\frac{1}{8}$ in. for the wing.
- 1 ,, 8 in. x 8 $\frac{1}{2}$ in. x $\frac{1}{8}$ in. for the fuselage.
- 1 ,, 6 in. x 8 in. x $\frac{1}{8}$ in. for the tail unit and spats.
- 1 ,, 4 in. x 1 in. x $\frac{1}{8}$ in. for the propeller and nose-block.
- 1 piece $\frac{1}{8}$ in. plywood for templates, seats and fairing fillets, 12 in. x 6 in.
- 8 pieces of brass strips from flash-lamp batteries, and $\frac{1}{8}$ in. screws, one $\frac{1}{8}$ in. brass screw for tail-wheel castor, and one old photo film, wood filler and plastic wood, and a piece of aluminium foil for the cowlings.

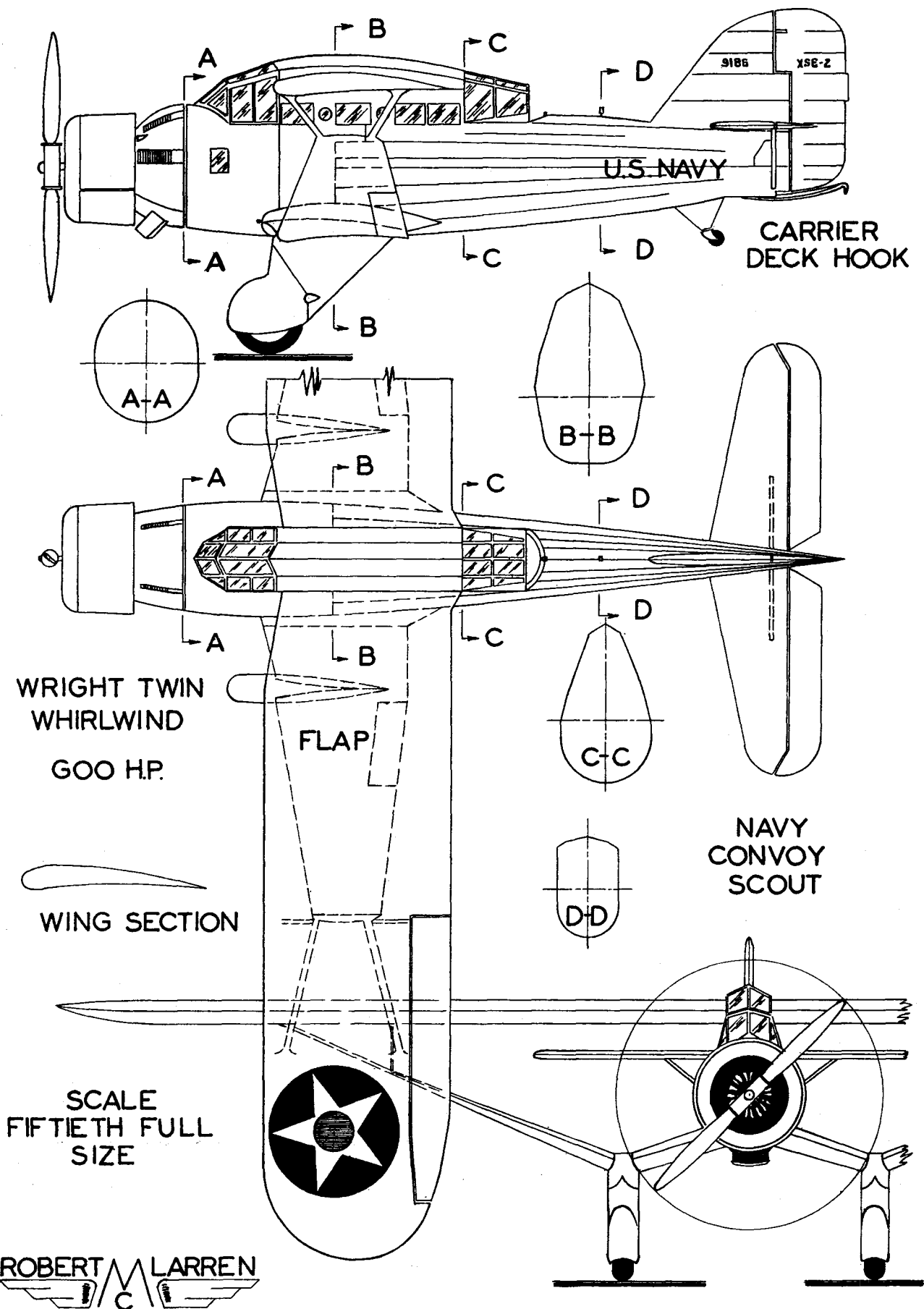
Build this fine model from the blue print given away with this issue. Next month's issue will contain a full-size blue print of a flying scale model of the supermarine "Spitfire"—Britain's fastest fighter. Order your copy now, using the form provided on the back cover page, so as to make sure of getting it without delay.



Owing to Mr. Dudley Ship, Hon. Sec. of the National Guild of Aero-modellists, having joined H.M. Forces, we have arranged for all Guild business to be dealt with at our Leicester offices, to which address all future enquiries and applications for membership should be addressed.

We regret that, owing to the outbreak of hostilities, we were unable to obtain delivery of the N.G.A. Lapel Badges, which were advertised in our September issue. All members of the Guild who sent orders for these badges have had their money refunded plus postage and poundage on their postal orders.

BELLANCA XSE-2



JOB MAKES A "COME-BACK" — Short Story

By ARTHUR MOUNTSTEPHENS



"That wasn't Home,
Sweet Home," he said.
"It was Rule Britannia."

FROM the time that Job Wood gave up model aeroplanes and took up music there was something lacking in our club. The finances of the club were entirely unchanged by his resignation; so were the club's record-making flights. The thing we missed was Job's antics. He was our antidote to dictators, gas-masks and brothers in the A.R.P. When he left, a Stygian gloom descended upon us.

He went suddenly, and he went unexpectedly. Months before our competition for our most valuable prize, Job, as usual, had been preparing. There was an intensity about this preparation that beat all his previous efforts. Night after night he would stay at home building in secrecy. Sunday after Sunday, just as we were approaching our flying ground, Job would be seen coming away with his box. His trials were secret too.

If we asked him about his new model, Job would look at us with a gleam in his eye and a compression of the lips which spoke volumes. Undoubtedly he had a model that was going to revolutionise flying.

Then he went, only two months before the competition. It may have been the cumulative effect of past failures, or it may have been something the treasurer said about subs. Whatever the cause, it was a tragedy. Job had laid down his balsa cutter and taken up the violin bow.

It was a violent blow. Gone were my exciting brushes with his wife, Sadie. Gone were the screaming adventures that were our lot when Job and his models met with farmers, cows, little boys and Job's own aunt.

Then at last, unable to put up with the deadly monotony of our club, which missed him sadly, I went round to see him. It was only a few days before our competition, and I thought that by tactful reference to his secret model I might induce him to come up on competition day.

It was a grand morning that I chose. It was a mellow, light-winded morning of blue skies and white feathery clouds, and just the morning to get his feet turned back into the paths of springy turf and happy, whirring pro-

pellers. In fact I was quite optimistic, until I thought of his wife, Sadie.

I could imagine her triumph when Job had cleared the scullery of all the balsa chips, dope and broken fuselages and gone into the drawing-room with his harmless violin that would never make any mess at all. I could imagine her gloating over the money they would save, with Job buying an occasional violin string and a penny block of resin once a year, instead of two shillings worth of balsa wood every Saturday night.

Yes, Sadie might be a stumbling block. But as I knocked at the door I felt that she might be out. Sadie usually is out on a nice day. But as the door opened I became aware of two depressing facts. Sadie was in, for it was she who opened it, and Job was practising the violin. There was a third depressing fact that became more and more obvious as I went along the hall. Job had not got beyond that stage when the bow insists on playing on two strings when the performer is bent on one. Merged with the rather low melody was a squeaky obligato from the bow.

"Bravo!" I said as the tune appeared to end "That's the best I've heard *Home, Sweet Home* played for a long time."

Job dropped his instrument from his shoulder, and regarded me with his gleaming eye.

"That wasn't *Home, Sweet Home*," he said brusquely. "That was *Rule Britannia*."

Which, of course, is the worst of these publishers putting two tunes on one page. A well-meaning chap never knows where he is.

"Anyway, the tone was good," I hastened to state, at the same time offering him a cigarette, in case he started playing again. As he took it I could feel Sadie's eye on the back of my neck. She has a presence like that, and I could realise quite well that I, "One of them aeroplane loonies," to use her own expression, was not in the least welcome.

"Jolly good, isn't he?" I ventured, turning to brave her stare.

She gave me a frigid look. "Eh?" was all she said at first.

"Jolly good!" I said, and managed a light-hearted little chuckle.

"I wish he'd chuck it, and take up his rotten flying again," said Sadie. "Sometimes I think my ear-drums will burst."

For the first time in my life I felt a warming of the heart to Sadie, and as she left the room I turned to Job with a hope born anew. Sadie had cleared the decks for me.

Job had turned to his music, and I adroitly turned his attention to his model box standing in the corner of the room.

"We're missing you at the club," I said at last. "Why not come back? Why not bring your new 'plane up to the competition next Sunday?"

He regarded me sadly, half turned to his music stand again, then shrugged his shoulders. "I think I will," he said suddenly. "I'm sick of this darn thing."

"Good man!" was all I could manage in the emotion of the moment.

Job threw his violin on to a chair, and came over to the window and looked out. The blue sky and the clouds did the rest. "Yes, call round on Sunday morning," he said. "We'll go up together."

"We'll go out together now, if you like," I said, and as he took his hat from the sofa I indicated to him that he had not put his violin in its case.

"Sadie'll do that," he said, pointing to an unwieldy looking box in the corner; just the sort of thing you'd expect Job to have for a violin case. And with his usual aplomb Job left his wife to clear up his muddle, and came out into the sunny world with me.

And the world was extra sunny on the following Sunday when we left for the Downs, Job carrying his aeroplane box with a jaunty air. For me aero-modelling had taken on its old delicious feeling of the erratic. Job was with us again. I did not know what was going to happen. Nor did Job. He wouldn't have been whistling *Rule Britannia* if he had. Or was it *Home, Sweet Home*? Job whistles just as he plays the violin.

We had to hurry, for Job had been totally unprepared for me when I called. He just had time to rush in for his model, and we ran most of the way to catch the bus.

Job received the cheers that greeted his reappearance among his club mates with a blushing face. Somebody mentioned the fact that he had not heard of Job's appearance at the B.B.C. with his violin. He crushed him speedily, and flatly refused to show us his wonder model until the time of the major event, which Job assured us he would win hands down. No, not a glimpse of that model did we get until three o'clock, the appointed time.

Job put his box down, sat on it, and repulsed every request for a sight of his hush! hush! creation. And, of course, the model became the main topic during the desultory flying that preceded our big event. So that at three o'clock, when Job stood up and proceeded to undo the fastenings, he had quite an excited crowd around him.

The box seemed to take a bit of opening. Job's hands trembled with excitement. I found myself wondering what on earth he had made during all those months of feverish preparation. The box was open at last. There was a nervous titter from someone; then a laugh.

For, nestling in the bottom of the box, was Job's violin! He said something about Sadie, who had placed the things in their wrong boxes.

Well, you might think that violins cannot fly. This one did; and crashed!

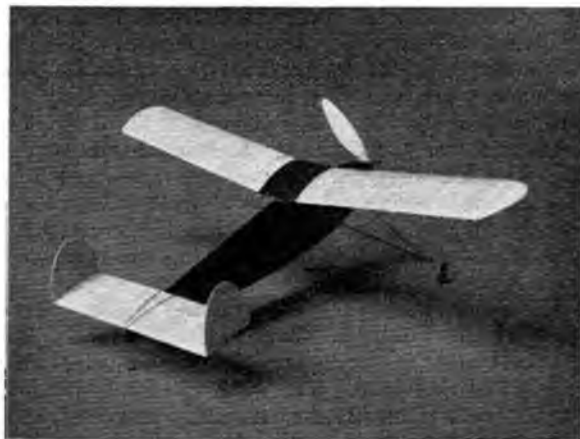
HAVE YOU READ THE NOTICES

on page 690, re Our XMAS ISSUE—Next Month?

on page 710, re The National Guild of Aero-Modellists?

on page 717, re Our Photographic Competition?

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Add 6d. carriage.

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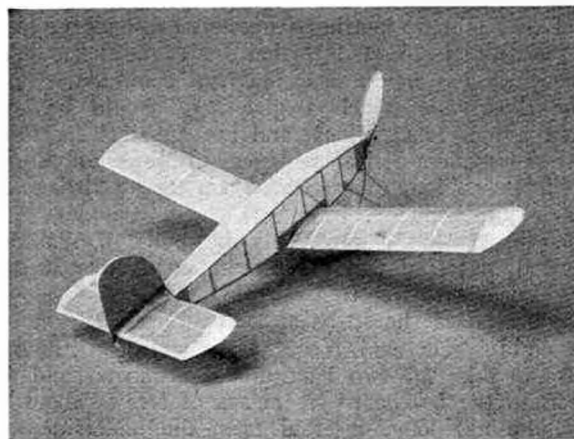
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"VERON" or "VERONITE" Kits

"VERON" Series

"EAGLE" Duration Model, 45 in. wing span	...	13/6
"HAWK" Duration Model 39 in. wing span	...	10/6
"BUZZARD" Glider, 60 in. wing span	...	9/0

Kits contain finished propeller, full-size plan, etc. Most comprehensive kits on the market. Add 6d. for carriage.

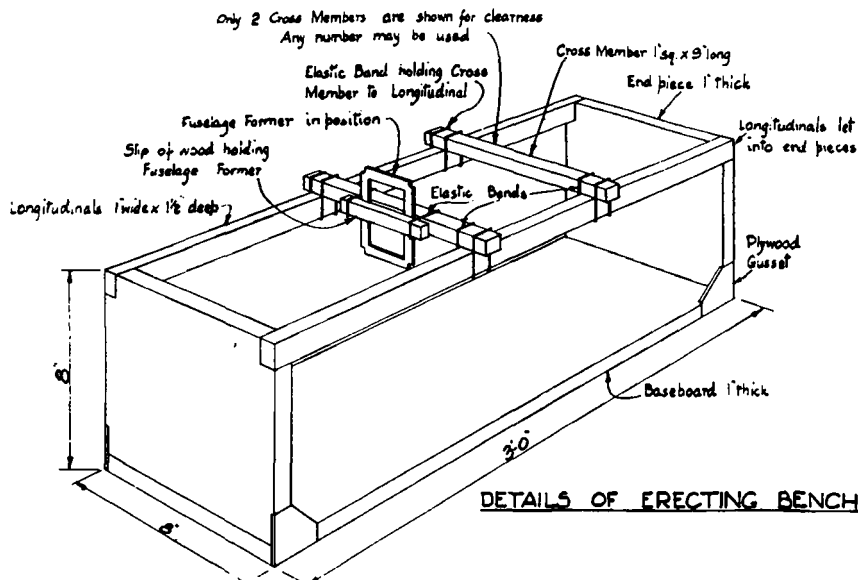


"VERONITE" No. 4

AN ERECTING BENCH—

By S. H. RUTHERFORD,

A.M.Inst.E.



A NUMBER of methods have from time to time been devised for the erection of model aircraft, but I think the use of the erecting bench or assembly jig about to be described offers distinct advantages over the majority of them.

Firstly, it is extremely simple and cheap to build, and, when in use, it forms a rigid base to which the parts of the model may be quite securely fastened while erection is in progress without any difficulty being entailed in removing the model when complete. It should prove a boon to those who prefer to use a casein glue, which takes some hours to set. The bench can be put away while the model is in any state of completion with full confidence that it will not warp or go out of shape due to shrinkage of glue, etc., before the remainder of the work can be carried out. It makes possible the spending of odd minutes putting longerons or stringers on a fuselage without risk of distortion due to the frame being subsequently left in an unsymmetrical condition.

The dimensions which I give here should be considered as only suggestions, and are intended for those who build moderate size machines. Builders of outsize or midget machines can modify them to suit their individual requirements.

The bench should preferably be built of seasoned hardwood, but deal will prove quite satisfactory if it is well seasoned and free from warping.

The baseboard should be at least an inch thick to be quite rigid. The end pieces are notched at the top corners to take the two longitudinal members, and are secured to the baseboard by means of screws about an inch-and-a-half long, inserted from the underside and countersunk into the wood. I recommend that they should also be glued. Care should be taken that they are square with the base in all directions, so that they may subsequently be used for reference in setting up the parts of a model. Gusset plates of thin plywood can be placed at the sides to ensure rigidity.

The two longitudinal members are now glued and

screwed into the notches provided for them. They should be quite parallel with the baseboard and with each other, and the top surfaces should be straight and flat and the same distance above the base. The careful carrying out of these precautions will be appreciated when a model is under construction.

The cross members are secured, as required, to the longitudinal members by means of elastic bands, as shown in the sketch. These elastic bands should be strong enough and tight enough to hold the members against movement caused by inadvertent rough handling.

Each of the cross members should be laid across the longitudinal members and truly at right-angles with them, and then a mark made on the cross member alongside each longitudinal. Another mark should then be made at the centre of the cross member, exactly halfway between the first two marks. When the cross members are replaced on the bench with the end marks against the longitudinals, the centre marks will all be in a straight line and will correspond with the centre line of the model.

The main frame and cross members should be given one or two coats of shellac varnish to render them reasonably waterproof, but care should be taken to avoid leaving "blobs" on the longitudinals or cross members, as they may cause difficulty in assembling squarely.

The parts of the model are secured to the cross members either directly, by means of elastic bands, or else by wooden cover strips, which are in turn secured to the cross members by elastic bands.

Now I will give a short description of the erection of a fuselage, to make the method of using the bench quite clear.

A datum line should first be drawn on the side elevation drawing of the fuselage. This datum should be horizontal, that is, at right-angles with the formers, and a little below their centre. The distance of this line from the top of each former is then carefully measured and a line drawn across the respective former in this position. The formers are now clamped to the sides of cross members by means of slips of wood secured by elastic bands in such a way that the line just drawn on each former lies along the bottom edge of the cross member and the centre mark on the cross member is central in the former. The cross members are fixed squarely to the longitudinals in their correct order, and so that the formers are correctly spaced. Any errors of alignment of the formers should now be corrected, and the insertion of longerons and stringers can be proceeded with at will. It is preferable to steam all the longerons and stringers to shape before they are inserted, as otherwise there are liable to be

stresses in them which subsequently tend to warp the fuselage.

When the fuselage is complete, the slips fixing the formers to the cross members are removed and then the cross members themselves withdrawn.

If it is found that the cross members prevent the insertion of certain stringers, these may easily be inserted after the fuselage is removed from the bench, but care should be taken in setting up the formers that this shall only occur to subsidiary stringers and not to main longerons.

It will be clear that wings and tail units can equally well be erected on this bench, the ribs being fixed to the cross members as with the fuselage formers.

For the assembly of one-piece mainplanes the cross members can be set over at the dihedral angle and the 'plane erected on edge.

The above description may sound rather complicated, but I can assure readers that the time saved in erecting the next model or two will amply repay the time spent on building the bench.

AUTOMATIC WING SLOTS

By R. BOOTH

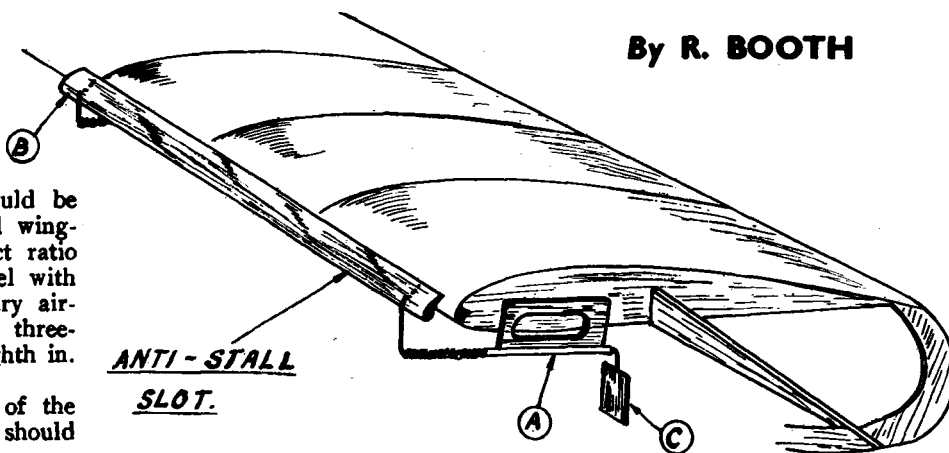
THE auxiliary airfoil B should be about one-fifth of the total wing-spread in length, with an aspect ratio of about 10:1; thus on a model with a 30 in. wing span, the auxiliary airfoil should be about 6 in. long, three-fifths in. wide, and about one-eighth in. thick, sanded to airfoil section.

The tissue on the underside of the wing to be fitted with the slots should be cemented to the last few ribs near the wing tips, so that the balsa block (cut from one-sixteenth sheet), and the one-sixteenth diam. aluminium tube A can be firmly fitted.

The wire shaft should be twenty or twenty-two s.w.g. music wire, and the spring which holds the airfoil off the main-plane, thirty s.w.g., made into a spring by firmly wrapping it round a piece of thicker wire or a hat pin.

The area of the pressure disc C (cut from one-sixteenth sheet balsa, and cemented to the bent end of the wire shaft), depends on what speed the slot is required to open at. If the pressure disc is large, the model will

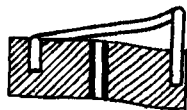
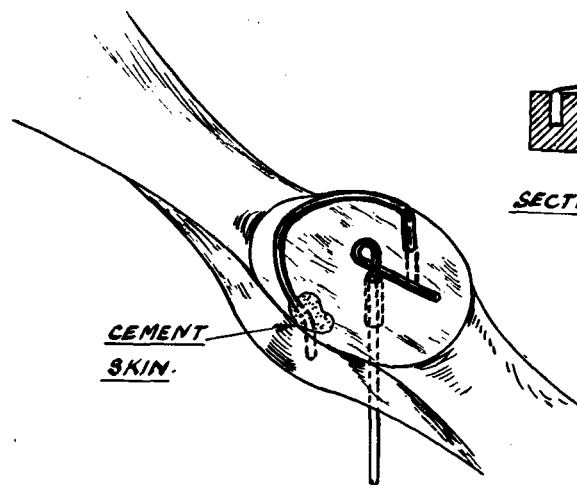
**ANTI-STALL
SLOT.**



have to fly very slowly before the slot will open.

An easy way to find the approximate area required is to start with a disc about three-quarters of an inch long and half an inch wide, and keep reducing its area, so that when you hold the wing and walk *into* a gentle breeze at a moderate speed, it will close on to the leading edge of the wing, and as soon as you slow down it should open.

The wire spring should be *fully* extended when the slot is open, and the bent wire that holds the pressure disc should be flush up to the end of the aluminium tube so that there is no play.



SECTION OF HUB.

A NOVEL FREE-WHEEL DEVICE

By J. CORBY

THE advantage is, of course, the extreme lightness of the device. Gauges of wire vary to suit different 'planes. The winding eye is formed on the prop.-shaft in the usual way, but a "striker-arm" is left, which engages with the perpendicular and longer face of a semi-circular hoop of wire, which is cemented in the propeller boss with one end countersunk. As can be seen, the projecting piece catches the "striker-arm" when the prop. is turning, but after the power has expired the "striker-arm" slides up the sloping face of the hoop whilst the prop. free-wheels.



'OOS AFRAID OF 'ITLER?

By "RUSHEY"

I DON'T know what your reactions are to the present crisis, but I know how I felt for some days. If ever I got my rag out, and wished to bite someone, I certainly did during the first two or three days following the declaration of war, and—I suppose in common with many other people—I didn't give a tinker's cuss for anything or anybody.

However, like with all other catastrophies, floods, acts of God, etc., we get to that stage where the first shock passes by, and start to look around to see just what is to be done (and the current state of "black-out" makes any "looking around" almost exclusively an inside job!) So, having settled down to a more normal condition of home life once again, the question arose, "What's to do?"

In my particular case, the almost complete stop of activities necessitated by the emergency has been felt acutely. For some years now I have had the honour of acting as Secretary to the Lancashire Model Aircraft Society, and with the steady and ambitious increase of activities in this club, have had my hands full in many directions. Time was still further occupied this year with the preparation and publishing of a monthly (*sic*) club magazine, which received a great deal of support from many northern clubs.

To utilise any spare time I may have obtained between the foregoing activities, and wishing to be in the swim with National Service (also, I must admit, to get some flying instruction at a figure somewhere within reach of my meagre pocket) I joined up in the first batch of Civil Air Guard volunteers at Woodford Aerodrome. Rotten weather conditions, and business ties, kept me from putting in as much time in the air as I would have wished, but what with one thing and another my time was fairly well occupied.

Another activity, and one that has taken an increasing amount of my spare time, is the matter of S.M.A.E. Council meetings—not forgetting the social and competition accompaniments. As many of you will know, my one ambition has been to get a better representation and consideration for the provincial clubs in the country, and naturally, when Mr. Rippon made his historic plea

for wider scope in the management of the movement, I, with others, gave the matter full support.

From this small start the scheme, now known as the Area Representation Scheme, has gone ahead like wild-fire, in spite of much opposition and attempted "sabotage." I am not making any rash statement—or boasting—when I say that it has been my privilege and pleasure to take a large part in the formulation and subsequent success of the scheme, and the biggest blow to me has been the necessary abandonment for the time being of all this work that has taken so long to get started.

From delegate to the Lancs. Club I was promoted to act as Area Delegate for the North-West Area, a section containing over twenty clubs, and this naturally brought in its wake many calls on my time.

And then—what happened? All set for an attack on the Biplane Cup, and with three competitions scheduled to take place on September 8rd, the whole thing has been dealt what many took at first to be a death blow. For the first time for months—I might almost say years—I found myself with time on my hands, and not a darn thing to do!

The first thing that came to mind was: "What must I do with club matters?" Having already received a paper from the Air Ministry instructing me to "stand by awaiting further instructions," the question immediately arose about procedure in the eventuality of my being called away on short notice.

By the time this appears in print my committee will have met and decided our future procedure. For my part, I have prepared the books in readiness for the signing over to a trusteeship, something on the lines suggested in Club News last month. If agreeable to the members, I shall carry on in my present capacity until called upon for other duties, whatever they may be. (Unfortunately, my hoary age takes me out of the piloting class in the Service, and my schedule reads "ground work," whatever that may be. Some unkind folk inform me that I shall most likely be created O/C. Latrines!)

Owing to the scattered membership of my club, the present transport restrictions will make our Sunday meetings difficult to organise, but I hope to be able to arrange a final meeting on the field, where we can run the two competitions required to complete our 1939 fixture list.

I see absolutely no necessity for a complete shutting down of activities; and for my part, with the club in its present high standard of membership, etc., I feel it would be a wise move to try and arrange at least a number of winter fixtures, including pole and microfilm flying, and any other features the members may like. Whether or not we shall be enabled to hold our annual dinner and social evening it is perhaps too soon to say, but I hope we shall be able to manage it. After all, the thing to do is to "carry on," and if that can be done as near normal as possible, I feel we shall be doing the right thing.

The position has not been made public yet regarding the S.M.A.E., but I doubt if I or others will be able to attend meetings now. Petrol rationing, railway restric-

tions, curtailment and discontinuance of cheap day trips will all have their effect, and I doubt if any but purely local activities will be able to continue. However, we must wait and see what the Council decide.

And so, what am I to do now? Well, there is only one thing, from what I can see. Hitler and his little pals would like to see us all cowering in dark corners, waiting for things to happen, but the British temperament is different to that. We are noted for our ability to carry on, and that is the best thing that I can do, in my opinion.

The curtailing of many activities has given me more spare time than I have enjoyed (I don't know if I am exactly enjoying it!) for a long time, and I see the chance now of building some of those "super-super" models I have had in my mind for years. The winter evenings, coupled with the black-out, will keep many of us inside, and what better employment can one have than producing a set of super-hot models for next season's flying? Just because there is a war on doesn't mean that we must all hibernate and go stale—the authorities realised that when cinemas, etc., were reopened. And so, for me the drawing board and work bench . . . and next year won't I have some fun flying?

"With the windows blacked and dark without,
I shall smile and listen to the Sauerkraut
Who nightly from Hamburg, with Oxford voice,
Spices baloney with a dash of choice
Sarcasm, at the British way
Of going along from day to day
With a grouse and a grin at fresh taxation,
And going to 'flicks' or like relaxation.

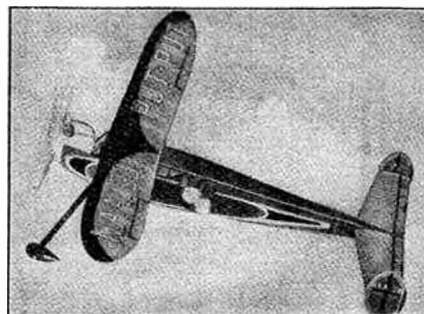
"I wonder what Adolph would say could he see
The manner in which both you and me
Are spending the midnight oil and rent
(In spite of the twenty-five per cent
Reduction in our normal rate).
I bet he'd sing a Hymn of Hate
And yell and rant at Rib. and Goering,
Insisting that each home is storing
A builder of 'planes, and in spite of Goebbels
Refuses to be rattled, and does his noble
Bit in keeping up the fun,
And laughter recently begun,
By Handley and his Office of Twirps.
Our answer is as always—Nerts!"

(The wife has read my hopes of model building, and given me a long list of home jobs that she insists must be done first! Ah me!)

Re PHOTOGRAPHIC COMPETITION.

Owing to dislocation of rail transport, delay occurred in the distribution of our October issue in certain parts of the country. Consequently, readers had barely time to post their entries to reach us by the closing date, September 30th. We have, therefore, extended the competition for another month. The new closing date is October 31st. All entries so far received will, of course, be eligible. The entry form is reprinted on the back inside cover page of the issue. So look through your photos . . . and maybe you will select a prize-winner! Full results will be published in our next issue—Xmas Double Number—and remember, all prizes are in cash, ready for Xmas spending!

"LIGHT" HOBBY FOR DARK NIGHTS



PUT- PUT

GAS - TYPE
RUBBER -
POWERED
MODEL

Flies and sounds
like a Gas model
36 in. Wing Span
Post 5/6 Free

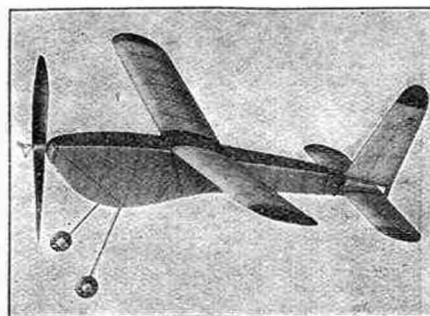
"NIPPY"

WING-SPAN
30 in.

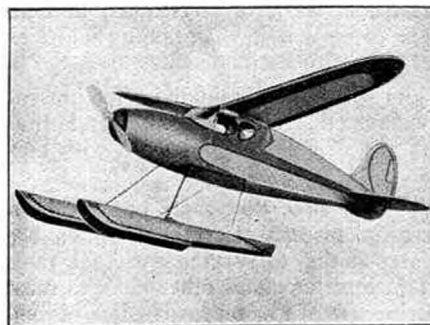
LENGTH
24 in.

Average duration
80-120 seconds

Finished propeller,
free-wheeling shaft,
balloon wheels, rib
outlines clearly
printed on M.A.T.A.
balsa, balsa strip,
wire, tissue, brass
bush, cement, dope,
tissue-paste, semi-
finished nose block,
FULL - SIZE PLAN
instruction sheet,
aluminium tube,
washers, and eight
strips of rubber.



UNBEATABLE VALUE. Only 6/6 post free



The SKEETER

Three in one!
Land, Sea and Ice-
plane. Suits every
need. 36 in. span.

8/6
post free.

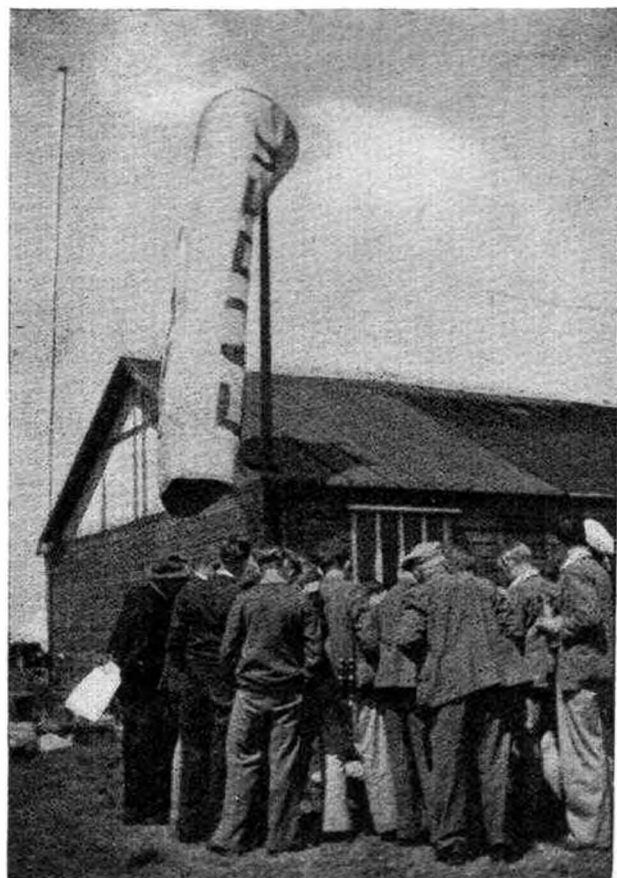
DICK KORDA'S WORLD RECORD HOLDER
54 minutes in the air. 43 in. wing span. Simple to build.
7/6 post free.

16-inch span models, 20 types.	Parcelval Gull, etc.	Post free	1/3
25-inch span models, 10 types.	Fairchild 24, etc.	Post free	2/9
30-inch span models, 10 types.	Fairley Battle, etc.	Post free	3/9
50-inch span models.	Curtiss Hawk, etc.	Post free	7/6
60-inch span models.	Rearwin Sports, etc.	Post free	11/6
King Bird, Gas model		Post free	£1 1s.

Japanese finished Propellers:
5-in. 6-in. 7-in. 8-in. 9-in. 10-in. 11-in. 12-in. 13-in. 16-in.
3d. 4d. 5d. 7d. 9d. 11d. 1/2 1/5 1/8 2/8
American Brown Rubber 1/-; 1 1/2; 1/3; 1/6 per 12 yards
Wholesale Supplied. Send 2d. for 28 page illustrated catalogue.

ELITE MODEL AIRPLANE SUPPLIES
14 BURY NEW ROAD, MANCHESTER 8.

AT THE SIGN OF THE WINDSOCK



AFTER making extensive enquiries throughout the model aircraft trade, we have ascertained that no real difficulty is likely to be met in maintaining supplies of material for model aircraft construction.

Certain imported kits will be unobtainable after present stocks have been exhausted, but we understand that several manufacturers are already in production with new kits similar to these.

We are pleased to state, also, that there has *not* been an all-round increase in prices. Certain supplies are subject to price variations, due to varying exchange rates—and naturally certain insurance and other charges must be provided for in prices from now onwards—but beyond this we do not feel that prices have been, or will be, increased much beyond their present levels for some considerable time.

We also wish to point out to our readers that the absence from our columns of several advertisements which usually appear does *not* indicate that these firms have gone out of business. There appears to have been a rumour in London that both Model Aircraft Supplies Ltd. and Premier Aeromodels had closed down. We are asked by the proprietors of these two firms to emphatically deny that they have done so. We personally visited both of them only a few days ago, and found all their usual staff busy; and plans being prepared for the introduction of new models at any early date.

From Model Aircraft Stores (Bournemouth) Ltd., of 127 Hankinson Road, Bournemouth, we have received two kits from the extensive range they are now manufacturing. The "Veron" series consists of the Eagle, Hawk (both duration models), the Buzzard, and the Swallow, which are glider kits. We have examined a kit of the Hawk, and from the very attractively printed box label, to the smallest detail, we consider the kit to be very well put up. The wing ribs are *completely* finished; i.e. not only shaped, but slotted and grooved for the leading edge. The propeller is completely finished, too. The main bulkheads, which are of three-ply, are also fully finished, a feature not often found in a kit at the price at which this is offered. Ample supplies of dope, rubber solution, cement, and adhesive are included, as also first quality tissue. Span of this model is 46 in., and length is 88½ in. The other kit was a "Veronite No. 1." With a wing span of 28 in. it is a very attractive model. The quality of the material in this kit is also very good. A finished propeller, free wheel, bushed wheels, etc., are provided. All parts are printed on best grade balsa wood. Model Aircraft Stores have an advertisement on page 718 of this issue, in which prices and other details of their wide range of models are given. A very attractive catalogue is offered by this firm, and we advise readers to obtain a copy of it right away. This firm asks us to state that their kits are of British manufacture, and that there has been no increase in prices of them, or in their well-known rubber.

* * * * *

We are asked by Messrs. Studiette Handcrafts to announce that they are sole distributors throughout Great Britain of the Studiette Genuine Dixon Scalecraft "Solid" Model Aircraft Kits. These kits are entirely British made. Fuselage and wings are supplied ready cut to outline shape, and ample materials are invariably supplied. Will dealers *who already obtain* Scalecraft Kits from the originators, please note that they should continue to order as before, but all new enquiries for Studiette Genuine Dixon Scalecraft Kits should be sent to Messrs. Studiette, at Birmingham. The many added expenses on manufacturing and distribution will necessitate increased prices throughout the Studiette range of kits and accessories, but every effort will be made to keep the increase as low as ever possible, and if it is found that at any time a reduction can be made, the advantage will at once be passed on to customers.

* * * * *

A firm which writes to us in a cheerful strain is Hunt's, of 5 South End, Croydon, who say: "Please state that this firm is carrying on as usual, that we still have the largest stock of model aircraft kits and accessories in the district, and that we are going ahead with the production of new lines. Our *propshaft assembly*, which has had the largest sale of its kind in the trade, is now very much improved, and consequently the new pattern now costs 7½d. complete with full directions. We also have a *new kit* of the Supermarine Spitfire, a flying model of 16½ in. wing-span, which sells at the low figure of 2s. 6d., and is complete with dope, cement, rubber, etc. We are still making *super balsa propellers*, and whilst our stocks last there will be no increase in the prices of these, which have been advertised in recent issues of THE AERO-MODELLER.

Incidentally, the famous propshaft assembly is illustrated in an advertisement of the firm on page 700 of this issue.

* * * * *

Another firm which reports that it is busy—and which has good stocks—is J. W. Kenworthy, of 127c Hankinson Road, Bournemouth. They say:—

“We are carrying on as usual, having plenty of stock of our usual lines, comprising propellers, jap tissues, bamboo, cup washers, Paulownia wood wheels and ready cut ribs, celluloid dummy motors.

“Retail prices only show a small increase, indeed, many items remain unchanged in price.

“A Mail Order Department is being developed, and a price list will be issued by the time THE AERO-MODELLER is next published.

“It will be sent post free to all readers of THE AERO-MODELLER who apply now.”

The advertisement of this firm appears on page 686 of this issue.

* * * * *

Messrs. S. Guiterman and Co. Ltd. ask us to state that whilst their showrooms and packing and despatch departments remain at 35 and 36 Aldermanbury, London, E.C.2, all communications should be addressed to their new premises at 1-2a High Street, Redhill, Surrey. Guiterman's are suppliers to the trade only, and have a wide and large stock of Megow aircraft, which is distributed via agents and retailers in all parts of the country.

* * * * *

Another trade firm who ask us to make announcements on its behalf is Chingford Model Aerodrome, of 155 Station Road, Chingford, London, E.4.

They say that they are changing the name of one of their kits—known as the “Astra,” to “C.M.A.1.” (We rather suspect that “C.M.A.” stands for Chingford Model Aerodrome, but, of course, we may be wrong!) This kit is very well known as producing a real “flyer.” The price will be 6s. 6d., and full particulars are given in the “C.M.A.” advertisement, which appears on page 685 of this issue.

Also offered by this firm is a new range of solid models, priced from 1s. upwards; and a series of scale model ship kits. This firm offers full support to retailers, and invites them to write in for lists and prices.

* * * * *

The Model Shop, 2 College Road, Barras Bridge, Newcastle-on-Tyne, are advertising on page 698 a kit for a 48 in. wing span petrol 'plane, the “MS” Bee, suitable for engines from 1½ to 2½ cc.

The attractive lines of the model are shown in a photograph, and details of the kits are also given. We believe this to be the lowest-priced British-made kit on the market, and at the price of £1 1s. it should prove excellent value for money.

* * * * *

On page 726 is illustrated the “Sprite,” a 38 in. span duration 'plane, the kit of which is offered at 9s., by Ashton Model Aero Supplies, of 58 Oldham Road, Ashton-under-Lyne, Lancs.

The model has sleek lines, and looks well capable of the long flights it has made—several of from two to five minutes, officially timed, as well as a “thermally-aided” one of 75 minutes.

Ashton M.A.S. offer a list of their products for the price of a 1½d. stamp, and we advise readers to obtain one, and also full particulars of the “Sprite.”

* * * * *

On page 685 of this issue appears the advertisement of National Modellers' Supply, of Tomlinson's Yard, Northgate, Huddersfield, who are suppliers to the trade only.

This firm states that it carries every well-known make of American kit, and that its stocks are exceptionally large. As National Modellers Supply offer the fullest support to retailers, in the shape of advertising matter, show cards, etc., we advise those who want to “stock-up” to contact them at an early date. N.M.S. are also prepared to loan blocks, models for exhibitions, and provide staff for special displays to retailers prepared to organise sales on a large scale.

* * * * *

Messrs. Elite Model Airplane Supplies, of 14 Bury New Road, Manchester, ask us to state that they have good stocks of finished propellers, kits, and a wide range of accessories, and that these are all illustrated in their latest catalogue, which runs to 28 pages, and will be supplied on receipt of 2d. A very interesting kit offered by this firm is the “Put-Put,” a 36 in. span high-wing model which incorporates a cunning contrivance which produces the sound of a miniature petrol engine when the motor is unwinding. The price of the kit is 5s. 6d. post free, and according to Elite, it “Flies and sounds like a gas model.”

* * * * *

Kanga Aero Models, of 1 Colonnade Passage, New Street, Birmingham, wish to draw attention to their “Kanga Mail Order Department.” This firm carries a wide range of flying and solid scale kits, in particular of R.A.F. machines. We were recently over at Kanga, and saw there a fine stock of kits and materials. These are all described in an extensive catalogue, fully illustrated, which will be sent on receipt of 4d.

* * * * *

Another firm which sent us a kit this month for examination and report was Messrs. Bristol Model Aero Supplies, of 51 Colston Street, Bristol 1. This kit is the “Setter,” a low-wing cabin model of 36 in. span. The kit is very nicely put up, and although the design calls for a tapered wing all ribs are marked out full size on good quality balsa, and simply require cutting out. A completely finished propeller and a nice pair of celluloid wheels are provided with the kit, which, of course, contains full supplies of rubber lubricant, balsa wood, cement, tissue fixture and dope (complete with brush for applying same), also a sheet of celluloid. The material is of good quality, and the accessories include a finished nose-block bush, shaped propeller shaft, wire for undercarriage, etc., etc. There is also an ample supply of rubber and a full size blue print. An advertisement on behalf of this firm, describing some of the recent successes of this model, is printed on page 727.

* * * * *

On page 727 appears Skybird's advertisement, reminding solid scale enthusiasts that their newest model is one of the latest French Fighters, “Moraine S 406.” Skybirds, whose address is (Desk A.M.) 8 Aldermanbury Avenue, London, E.C.2, will send to all readers a 4-page illustrated price list of their wide range of solid scale models for the price of a 1½d. stamp.

NOTES ON CONSTRUCTION

By "INSTRUCTOR"

Fitting Cabane Struts.

Scale models of parasol-winged machines, and many biplanes, often require cabane struts to support the upper wing, these struts to be fitted at various angles to the fuselage. It is often difficult to glue these in place all at their correct angles, and it is a fiddling job at best. The job can be simplified as follows. Two pieces of $\frac{1}{16}$ in. or $\frac{1}{8}$ in. flat balsa are first cut to shape and temporarily attached to the fuselage as shown in Fig. 1. The wing is then pinned to the top edges of these pieces, the pins either passing through convenient ribs or the leading and trailing edges. Now, with the wing held firmly in its correct position, it is a simple matter to cut each cabane strut to its correct length and cement into position. Finally, when the cement has set hard, the pins are removed, and the balsa jigs removed from the fuselage.

Adding Strength to Fittings.

The use of small bamboo pegs should not be overlooked in fitting struts. These are sharpened to a point at each end and forced half-way into the ends of the struts, and cemented. Then, on assembling the struts, the protruding end of the peg is forced into the longeron or wing rig, and cemented. Still better practice is to provide a small balsa

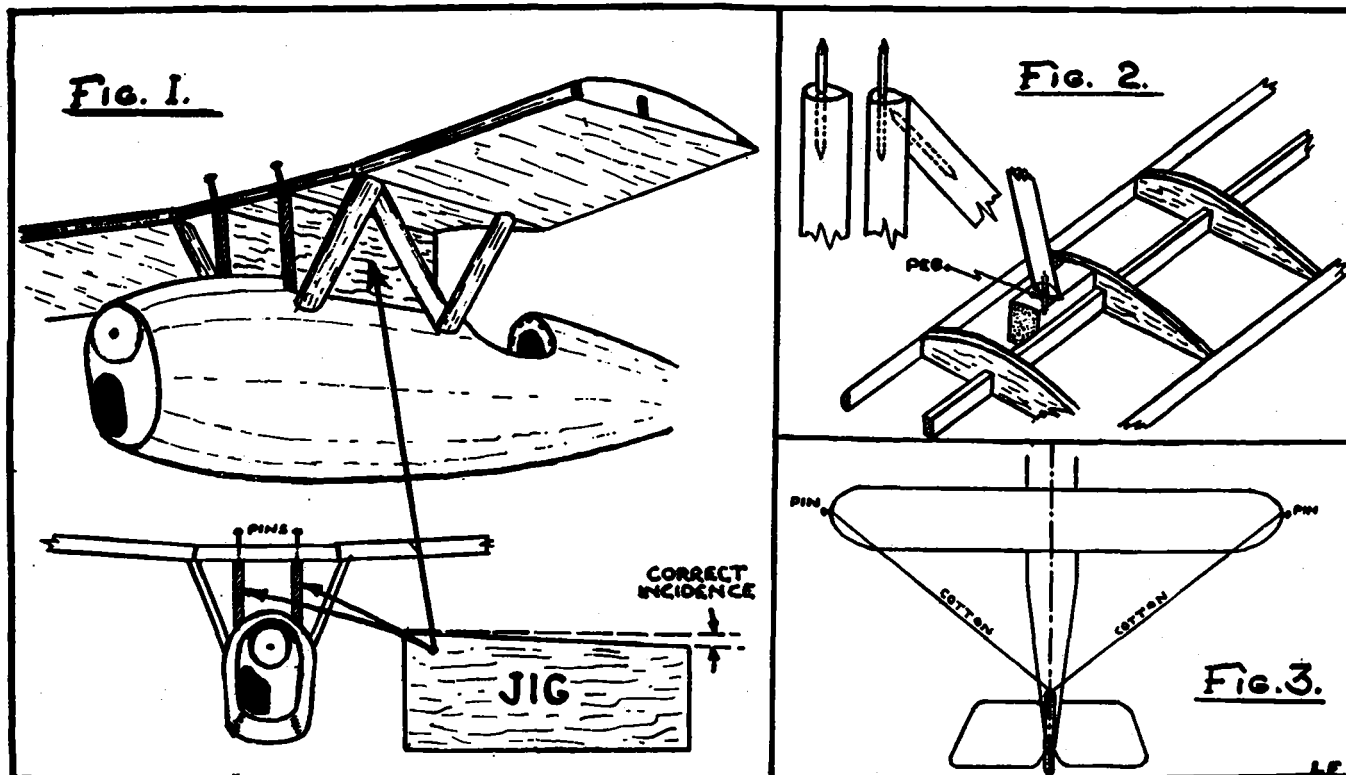
Lining Up Wings.

Another point which arises in fitting the wing is that of setting it at right-angles to the fuselage, and many modellers rely on the eye alone for this. However, perfect accuracy can be obtained as follows. Two pieces of cotton of equal length are attached, one to each wing tip, with a pin or spot of cement. Then, when the wing is placed on its struts or cabin-top, the free ends of the cottons are brought together to meet on the centre line of the fuselage, as in Fig. 3, and kept thus while the cement sets.

Having got the top wing set accurately, attaching a biplane's lower wing halves is simplified. Just use pegs in the inter-plane struts and the wing roots, and the whole job will fit together like a jig-saw puzzle. Incidentally, even if not specified in the plans being used, it is advantageous to cement duplicate wing root ribs to each side of the fuselage, as described last month, to form a good cementing surface for attaching the lower wings.

Balancing Large Models.

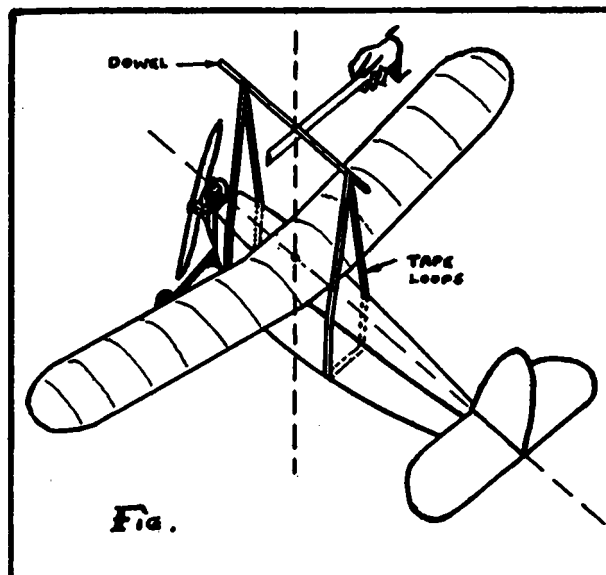
Locating the centre of gravity of a large model, such as a petrol machine of 6 ft. span, usually requires two people, one to support each wing tip, while the wing position or adjustable battery is shifted until the C.P.



block at the points of attachment. (See Fig. 2). It is distressing to see a well-made scale model shed its struts on a hard landing, and the extra work involved is well repaid. Of course, a small piece of tissue must be removed at each point of attachment to give the cement a good holding surface.

of wing is in the correct position. This method also puts an undue strain on the wing, as the whole weight of the machine is concentrated at the wing tips, whereas in flight the load is distributed over the whole wing surface. The job can be done single-handed, however, as follows. Take two pieces of linen tape about $\frac{1}{4}$ in. wide

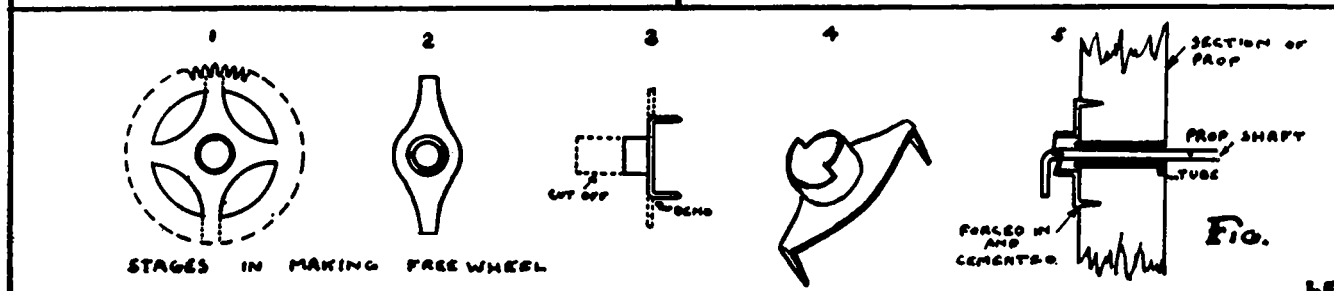
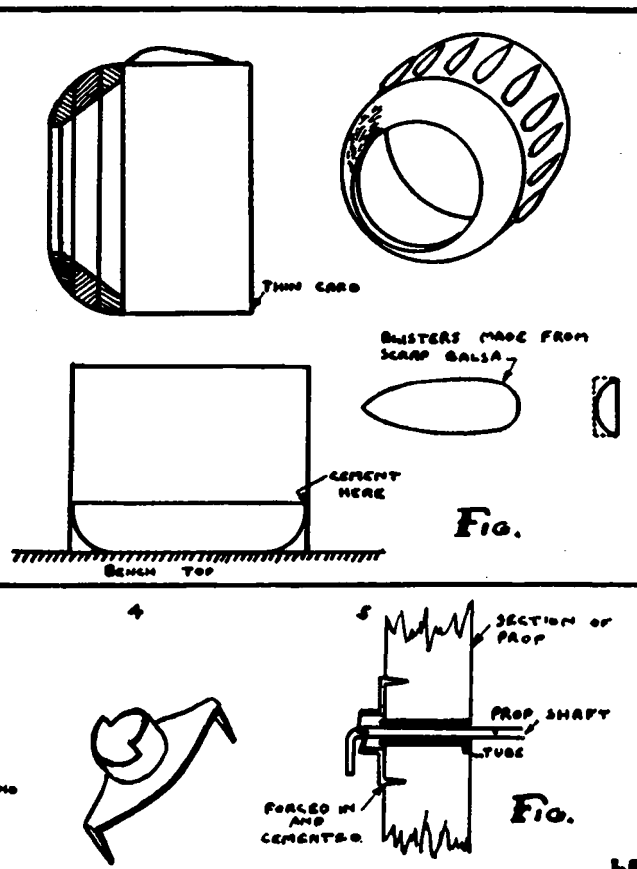
and 2 ft. long, and a piece of $\frac{1}{2}$ in. dowel rod about 18 in. long. Mark the centre of the dowel with pencil. Pass the tapes round the fuselage of the completed model, one in front and one behind the approximate wing position. Tie the end of the tapes to form loops, and pass the dowel through these. The model can then be balanced on the edge of a wooden ruler under the pencil mark on the dowel, and the wing etc. moved until the model hangs horizontally with the pivot, i.e. the centre of gravity vertically over the C.P. of the wing. Fig. 1.



after with a razor blade and sandpaper. The joined edges of the skirt should be at the bottom. Rocker covers or blisters are each made from scrap balsa, and the required number cemented round the skirt. A coat of paint all over, silver on the inside, and the job looks extremely realistic.

A Simple Freewheel.

From a discarded clock take the wheel which carries



Making Cows.

Cows for radial engines can be made quite easily, as shown in Fig. 2. The front is several rings of soft balsa, cemented cross grain to the thickness required by the radius of the front. As much wood as possible is cut away from the inside, to save weight, and the skirt, of very thin card, or stiff paper, is cemented on. It is best to make the skirt too long, then stand it upright on the bench, and push the ring in from the top, till it lies flat on the table. Then cement ring and skirt together. They will then be square, and the skirt can be trimmed back

the hour hand. This will be found to have a long boss, through which the minute hand spindle passed. Cut down the boss to about $\frac{1}{2}$ in. high, and cut away all the rim of the wheel, leaving just two spokes attached to the hub. Fig. 8 will make this clear. Then file the ratchet on the boss as shown. The propeller hub is bushed with a piece of aluminium tube to fit the shaft, and the free-wheel fitted to the face. To do this the two spokes are bent at right angles and forced into the propeller and well cemented. Finally the front end of the propeller shaft is bent at right angles to engage with the ratchet.

A LETTER TO THE EDITOR

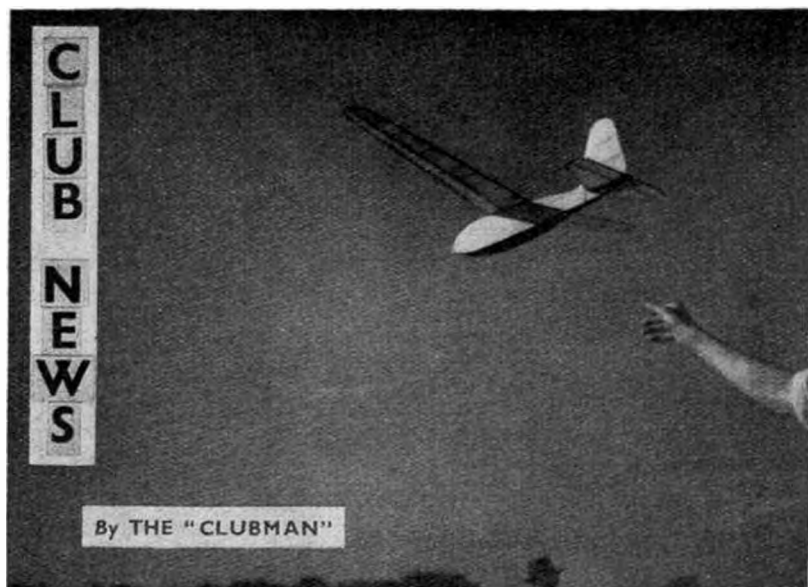
DEAR SIR,

I feel that I should come out of my retirement in order to correct an impression which might be gathered from the letter from Mr. A. Wilson, of the Hayes and District M.A.C. in the October issue of THE AERO-MODELLER.

If Mr. Wilson will read page 120 of the January issue of THE AERO-MODELLER he will see that the competition

committee were empowered to co-opt experts on various types of models. Perhaps he will ask two of his fellow club members, Bunny Ross and Eddie Keil, what hand they had in forming the rules for this year's power competitions; and has Mr. Wilson ever taken the trouble to find out how many petrol enthusiasts are actually on the Council?

FROM THE "MOVING FINGER"



HOWDY fellows! Since my last chat with you all things have settled down to a bit more like the old times, and many people are wishing to follow normal pursuits as far as possible. After all, what is the good of sitting around waiting for the worst to happen—it comes soon enough without looking for it.

Many of you have followed my advice given last month regarding future club procedure, though I am afraid that some clubs have immediately gone out of existence without giving the new conditions a trial. This I feel is the wrong thing to do, and the attitude I should like to see followed is contained in a very succinct letter from Mr. Gordon, of the HORNCHURCH M.A.C. I quote it in full for your interest:—

"We venture to wonder what prompted the Editor to even mention in his editorial the possible demise of aero-modelling due to the international situation.

"Whilst the ranks of many clubs may suffer temporary loss of membership, it is our experience that during the coming months our activities will be increased.

"Many of our members have been called away to do sterner stuff, but those who remain are determined that production shall go on apace. Upminster Common has, for the past three Sundays, shown no indication that things are on the downward trend. Far from it, for several new machines have been tried out with much success. Too much, in one or two instances. Our evening meetings have had to be postponed for a week or two until arrangements have been made to secure premises which can be suitably "blackened out." In the meantime members have co-operated in placing their own workshops at the disposal of less fortunate ones.

"Have the majority of the officials of the S.M.A.E. been called to duty? If not, are you able to inform us why there is no apparent activity amongst the governing body. Are we to understand that if certain members have been called away the activities of the S.M.A.E. will close down for the duration of the war?

"It seems to us that there should be no reason for such an action. Should not business be carried on as usual? The Wakefield Cup has remained in the U.S.A. in circumstances best forgotten, but do not let us find ourselves unprepared to tackle this problem should circumstances permit of the competition being held next year.

"Like many other clubs, we are not unmindful of the apparent disregard of Viscount Wakefield throughout the proceedings in the United States, and whilst we wish to make our contribution to the national endeavour to secure the return of the Cup, it is our emphatic view that the American authorities should be reminded, not only of the seriousness of this competition, but that our patron is the donor of the trophy. May we express the earnest hope that when peace 'breaks out' we shall all, without exception, be reunited in the resumption of organised meetings and events. In the meantime we carry on!"

To comment in part on this letter, I would state that evidently the Editor had in mind the many requests for information received at THE AERO-MODELLER offices, which lead to my own advice printed in the October issue. You must remember that the membership of many clubs is composed of

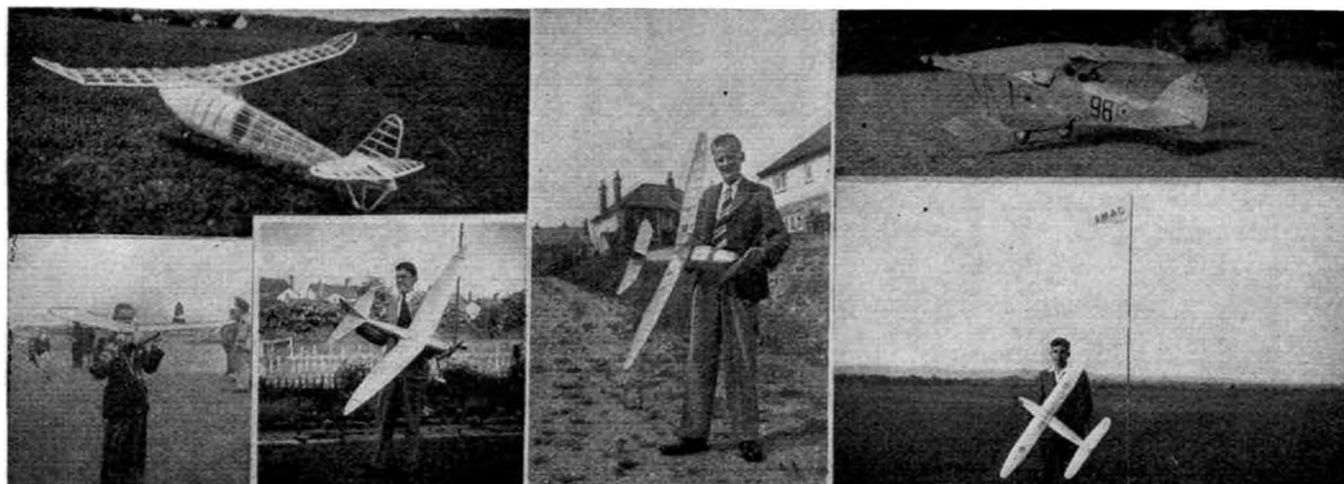
young chaps who are glad of the advice given occasionally by the older men among us—especially in such times as the present, when problems they have never had to face before are cropping up right and left.

Some clubs, also, owing to a scattered distribution of membership, may find difficulty in carrying on their ordinary outdoor activities, especially in view of the increasing handicap of transport facilities. I see this item has been mentioned in the article by "Rushy," and trust others will follow his example, and try and arrange indoor fixtures for the dark nights.

The apparent demise of the S.M.A.E. is puzzling at the moment, mainly because there is absolutely no news from official quarters. Naturally we all expect a curtailment—or possible suspension—of national governing for the time being, but I submit that an official announcement is required and expected, and would do much to clear up the feeling of unrest and dissatisfaction that is becoming apparent.

Naturally, special commitments and activities will play their part in preventing normal continuance—the treasurer had been evacuated with his firm before the last Council Meeting—but I would ask that an early announcement of either policy or suspension be made, if only to settle the minds of those members of clubs and areas whose especial duty it is to report S.M.A.E. matters to those they represent.

I have not commented on the Wakefield Finals so far, and at the moment I feel unwilling to say very much on the subject, but I am in complete agreement with Mr. Gordon's remarks on the discourtesy afforded our patron. From what I have heard and seen, the whole event was run by and for a person whose main object was reflected glory—(publicity to you!)—and altogether gave cause for a few heart and headaches. Happily, this only applies to the "business" side of the matter, the chaps who really matter—by whom I mean the real model flyers—being, as usual, a bunch of good fellows. I have not had the pleasure of meeting him, but I am told by all who did that Korda is the best of fellows, and I, and you, will be the last to grudge him his victory. However, get down to turning out something super in an effort to get the Cup back here once more. Disappointment this year has not put the damper on our hopes or efforts—



Top left: A "Tse-tse Fly," built by Mr. Tinley, of Speldhurst. Bottom left is shown Mr. Metcalfe, of Dublin, with his petrol model, and to the right of him is Mr. S. Gardener, with his club "Scientific," a "close-up" of which is at the bottom of this page. In centre is Mr. H. J. Fisher, of the Farnham Club, with his record holder. At top right is shown a fine looking model of a Hawker "Hind," built by Mr. R. Monks, of Beccles, and underneath is Mr. C. W. Quinnet, and in background the Speldhurst Flying Ground.

and you've got a lot of time this winter's black-out to give the old think-box a workout!

Reports are, as expected, few and far between this month, but I suppose this will remedy itself as more and more of you get your teeth into things and realise that the best thing to do is carry on until called for other duties. I'm wondering how long my snow white hair and flat feet will hold out!

A fine photo is sent in this month by a young member of the ULSTER M.A.C., the sender being Mr. S. Gardner, and the model a first attempt at a power model. This looks a fine piece of workmanship, and I look forward to details of the test flights with this machine, none having been made up to the time of writing.

The GRIMSBY AND D.M.A.C. held their annual competition for the Gladding Cup on August 27th in glorious weather. Machines had to weigh 7 oz. with a wing area of 150 sq. in. Results were:—

1. P. Hoyland ... 96.3 sec., average of 3.
2. D. Gladding ... 68.7 " " "
3. H. Perry ... 63.7 " " "

One member averaged 100.3 sec., but was disqualified through being under weight, as was another competitor. Unfortunate this, but rules are rules, and it beats me how anyone can enter an event with machines that do not comply with the regulations. The obvious course is to weigh the machines before any flights are made, this cutting out any difficulties of such nature. Mr. Monument made an unofficial flight of 145 sec., the model last seen heading over the Humber. (Trawlers, please note!)

Mr. W. Ducker, of The Cedars, 8 Queen Street, Barton-on-Humber, wishes to form a club in that district, and asks for those interested to get in touch with him.

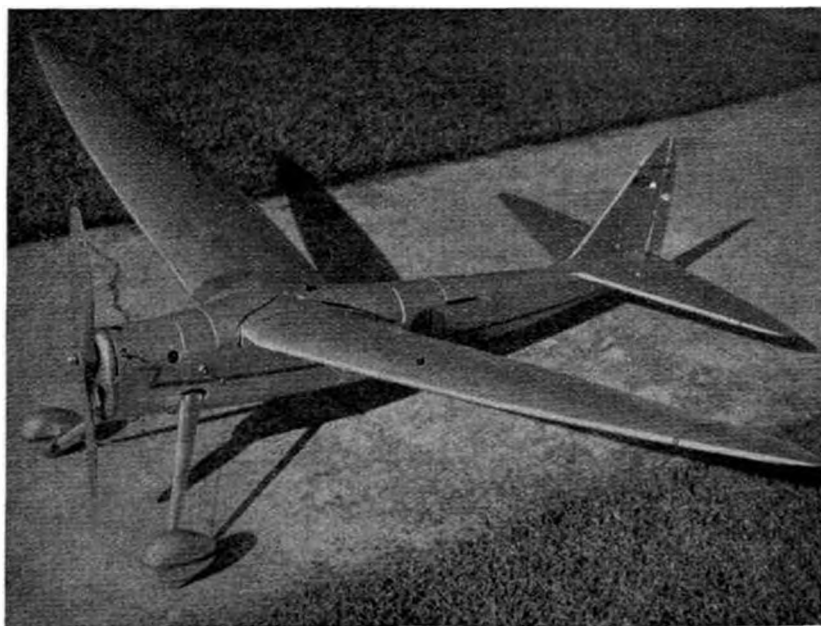
A change of secretaryship is noted from the FURNESS M.A.S., the new man being Mr. K. Lowe, of 8 Carisbrooke Crescent, Barrow-in-Furness. This club has managed to add three cups to its assets. Some ardent members have been night flying with gliders, fitted with an electric light in the nose. Very

effective, especially the night when the light failed, and search was only finished near the midnight hour! I like the tale of the member who discovered a new way to take the warp out of mainplanes by holding it over a gas flame until it goes up in flames—and then rebuilds it!

Unfortunately, conditions have cancelled the planned Gala Day of the STOCKTON-ON-TEES M.A.C., but consolation is gained from the collection of four prizes at the Newcastle Rally.

The Westwood Club has changed its name to the BEVERLEY AND D.M.A.C., and all previous officers were re-elected at the recent annual general meeting. A fund has been started to send small gifts of cigarettes to R.A.F. stations abroad. Good work, lads!

Weather and Hitler are blamed for poorly attended meetings of the NORTHAMPTON M.A.C. A meeting held for those members not having won a first place in



A club "Scientific," built by Mr. S. Gardener, of Belfast—a very fine piece of workmanship.



Mrs. "Freddie"—to whom we wish all happiness, and may she be a true aero-modeller's wife, and never laugh when the rubber bursts!

previous competitions this year was won by B. Bascombe with a time of 83.6 sec.; followed by G. Smith, 72.2 sec.; and K. Chapman with 68.4 sec.

The ALDERSBROOK M.A.C., or, as they say, what's left of them, have decided to temporarily disband until after the present trouble has been given a bit of down-thrust! Many of them have turned scale fans owing to the flying ground being inundated with A.A. guns and tents, so the interest is still here. (Thanks for the "accidently shot" warning Palmer—I'll take along my tin pants!)

The LANCASHIRE M.A.S. affairs are fairly well dealt with in a separate article by the secretary, so it only remains for me to state that it is hoped to continue to bring out the club magazine, though not as regularly as was hoped. Transport matters are handicapping this club a great deal, as also are the ground difficulties encountered this year owing to official restrictions on the use of aerodromes. Many snags have been encountered this year, but it takes a lot to keep these lads down.

Full details of activities are promised for the next issue.

Owing to the outbreak of hostilities, the outdoor section of the East Anglian Rally, organised by the CLARE AND D.M.A.C., had to be abandoned, but the scale section was well patronised. The Clare Club won the Challenge Trophy, while individual winners were Miss J. Ridley Hooper (Ipswich), Miss M. D. Pryor (Cambridge), and M. Cady Byford (Clare).

By the way, "Freddie" recently got married, and had the cheek to send in the sketch which appears on the opposite page, as this month's contribution! What a nerve—to portray his fair lady in such a manner! And what a sport she must be, to allow the sketch to be printed! Any way, herewith I publish a photo of Mrs. "Freddie," as she really is, holding one of her husband's models. "Freddie" has already sent in his sketch for our next issue—and, lads, it's the goods!

The inter-club meeting proposed by the MACCLESFIELD M.A.S. in conjunction with the Lancs Club has had to be abandoned temporarily, which is a pity, as arrangements were practically completed. The field is practically inaccessible to anything but cars, however, and the present restrictions wash that out. Many members are building all types of models during the black-out, and the club is now proceeding almost normally, though one or two have had to leave for the R.A.F.

After three postponements, the DUBLIN M.F.C. managed to hold their first competitions day on September 17th, with the following results:—

LIGHT-WEIGHT CLASS.

- | | | | |
|-----------------|-----|-----|-------------------|
| 1. S. Wells | ... | ... | average 69.5 sec. |
| 2. Miss Charles | ... | ... | " 85.5 " |

BIPLANE.

- | | | | |
|----------------|-----|-----|----------|
| 1. W. Aherne | ... | ... | " 52.7 " |
| 2. J. W. Jones | ... | ... | " 48.6 " |
| 3. E. Casey | ... | ... | " 45.7 " |

WAKEFIELD.

- | | | | |
|------------|-----|-----|----------|
| 1. Danlman | ... | ... | " 85.5 " |
| 2. Keogh | ... | ... | " 44.6 " |
| 3. Brazier | ... | ... | " 42.9 " |

MEDIUM-WEIGHT.

- | | | | |
|--------------|-----|-----|----------|
| 1. J. Maher | ... | ... | " 71.2 " |
| 2. P. Hughes | ... | ... | " 60.0 " |
| 3. T. Buggy | ... | ... | " 52.8 " |

SCALE.

- | | | | |
|----------------------------|-----|-----|----------|
| J. P. Archbold (Monocoupe) | ... | ... | " 82.2 " |
|----------------------------|-----|-----|----------|

This club now numbers 28, including 8 ladies. The Irish clubs are doing their best to encourage and protect model flying in Eire, and ask all in that country to get in touch with Mr. J. P. Archbold, 382 North Circular Road, Dublin.



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The WIRRAL M.A.S. wish me to announce that they have suspended activities until the end of the war. This club raises a point that needs clarifying, as follows:—

"Many members have asked why our report was not printed in the October issue. Several have stated they think it unfair for unaffiliated clubs to be included in the news column, whilst our own, which is affiliated, is left out."

Now, chaps, I want to make it clear that no matter whether a club is affiliated or not it receives exactly the same treatment in these columns. As always, I advocate to all clubs the advisability of becoming affiliated to the S.M.A.E., but such action does not give such clubs any prior right to inclusion in these notes, which, as headed, are Club News! The fact that the Wirral report was not included last month is due to either of two things: (a) That the report was not received at these offices, or (b) that there were no "general interest" items worth inclusion. I am not able at the moment to check up on the reports received last month, but trust you are willing to accept the above remarks.

Miss Pat Webb, of the BLACKHEATH M.F.C., has turned out a creditable model for her debut, whilst Dicky Brown has released details of his latest racer. A 15 in. span of super-streamline design, the port plane has a greater area to counteract torque. Forty strands of $\frac{1}{8}$ in. brown drive a $6\frac{1}{2}$ in. three-bladed prop. for approxi-

mately three seconds, and tests show the machine capable of speeds of 60 m.p.h. Total weight of the machine—which is french polished—is $4\frac{1}{2}$ oz.

Ron Mackenzie made the onlookers gasp when he "chuck launched" his all balsa glider into the air, and clocked over 6 minutes O.O.S., breaking the club record of 37 sec.

Recent competition results are:—

GOSNELL TROPHY.

1. E. Chasteneuf ... 148.06 sec., average of 8.
2. M. W. White ... 137.4 " " "

FAULKNER TROPHY.

1. M. Jackson ... 142.8 " " "

A flyway on his first flight gave Jackson a new junior club record of 428.4 sec.

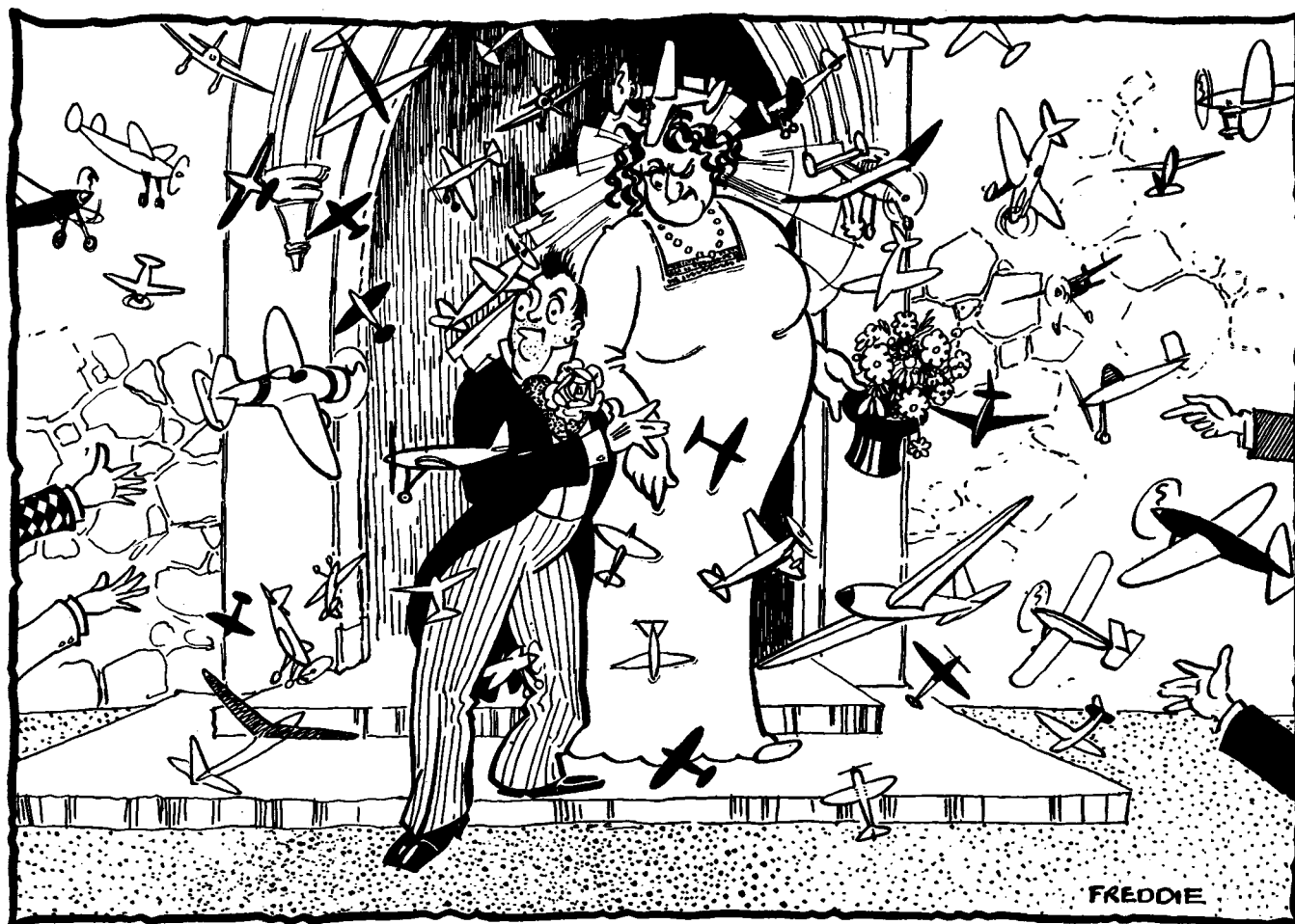
The Open Day at Epsom Downs attracted quite a number of spectators. Three competitions were held, resulting:—

Heavy-weight: H. Simmonds.

Light-weight: Ransom.

Glider: E. Chasteneuf.

Our final report this month is from the SPELDHURST M.A.C., who report good work proceeding on bicycle trailers, models, for the use of. Two photos sent in show a good view of the flying ground, and these chaps are to be congratulated on what looks like a good spot.



INTERESTING FORM OF CONFETTI SEEN AT FREDDIE'S WEDDING

And here is another "right spirit" letter which I have just received from the chairman of the HINCKLEY MODEL AERO CLUB:—

"Our club was very interested in your leading and last paragraphs in "Club News" (October), as our views on the carrying on of club activities under the present conditions certainly agree with yours, the committee decided, with the fullest approval of every member, to carry on with the good work exactly as in normal times for as long as possible, the following will perhaps interest you and give an idea of our intentions.

"The declaration of war, of course, put an end to the "Igranic Trophy" Contest, at which we were hoping to gain some valuable experience in competitive flying. (This would have been our first attempt). Not to be done out of our bit of excitement, the committee purchased a cup to be competed for every six months, open for any size fuselage model, R.O.G., which was flown for on September 24th in a half gale, and won by the Club Sec., Mr. T. W. Orton, with an average of 70 sec. There are two or three models already half-designed, with which it is hoped to remove it from his sideboard next April.

"We are to have a scale competition just previous to Christmas, and two of the boys who have gone with the Militia have left their models already entered. (How's that for real modelling enthusiasm?) It is also our intention to hold some form of duration contest during the Christmas week—the H.M.A.C. boys have a liking for winter-flying. R.O.G. boards are necessary when the snow is crisp; we were rather sorry last year when we saw the grass uncovered again.

"Our activities may be curtailed sooner or later, but

events will only be postponed, not abandoned, and while we have the slightest chance to go ahead we shall do so, and to 'hell with Hitler.'

"One can hardly understand any club, whether large or small, dispersing now, when there is probably no necessity to do so for several months. Surely, if there is only one or two left to carry on, that is much more satisfactory than having to entirely reform at a later date. To my way of thinking, it takes too much hard work and worry in the forming of a club to let the present conditions cause the immediate cessation of all modelling, whether social or active, which last word gives me a nasty jolt. Now that the petrol rationing is in force we all have at least seven miles to cycle to our flying field, so we shall be getting our share of action.

"This letter would, of course, in the usual state of affairs have come from the secretary, but that poor chap, being so busy with the A.R.P. and St. John's, etc., I thought I had best relieve him.

"Yours very sincerely,

"ARTHUR D. DEBENHAM (Chairman).

"P.S.—Will you please sport a white gardenia when on the Western Front, in case I should run into you?"

Now, I think that some of the larger and older clubs can take a lead from this relatively small and young club. We ought to carry on, and we *must* carry on. And I hope to have just the same number of club reports to deal with next month. Don't think that this section is going to be drastically cut down, just because last issue was somewhat reduced in number of pages—that was only a temporary restriction. This month the issue is larger

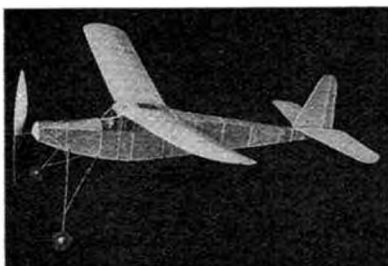
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Overall length 26 in.

Kit 9/- complete

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1 hour 15 min. with a SPRITE!!!

On Sunday, Aug. 6th, a SPRITE was lost out of sight of time-keepers at Ashton and on the following Tuesday a letter was received stating that the model had been found at Hadfield, 9 miles away and undamaged, being up for 75 minutes. The model was built by Mr. C. B. Jackson and on its first day out helped to win the team competition at the Bolton rally. Other officially timed flights are:—4 min. 53 sec.; 3 min., out of sight; 2 min. 33 sec., out of sight; 2 min. 17 sec., out of sight; 90 sec., out of sight.



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and carries an extra eight pages in the blue print. And next month, the Editor tells me, will bring a greatly enlarged issue for the Xmas Number.

Well, blokes, that's all for this month. Don't forget, the best way to nark Hitler is to carry on, and I am sure that we shall all be doing our bit by continuing to build, fly and chase our models as before. Nothing is worse than giving way to misery, and I'm certain that aero-modellers can find a better thing to do than that.

Here's hoping it won't be long before things are back to normal, and until then—Scram Hitler!

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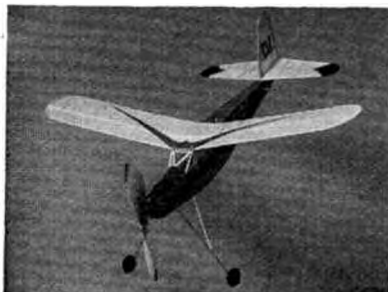
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ALLEN HOUSE, NEWARKE STREET, LEICESTER

I enclose herewith my entries for your photographic competition. I have read the rules as published on page 621 of the September issue of The Aero-Modeller, and hereby agree to abide by them. I am not a professional photographer. I am the owner of the models shown in the photographs I have entered.

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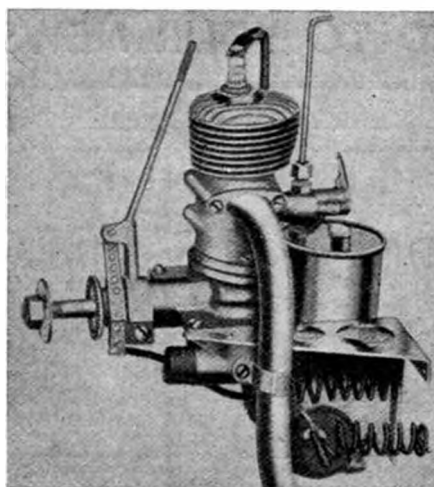
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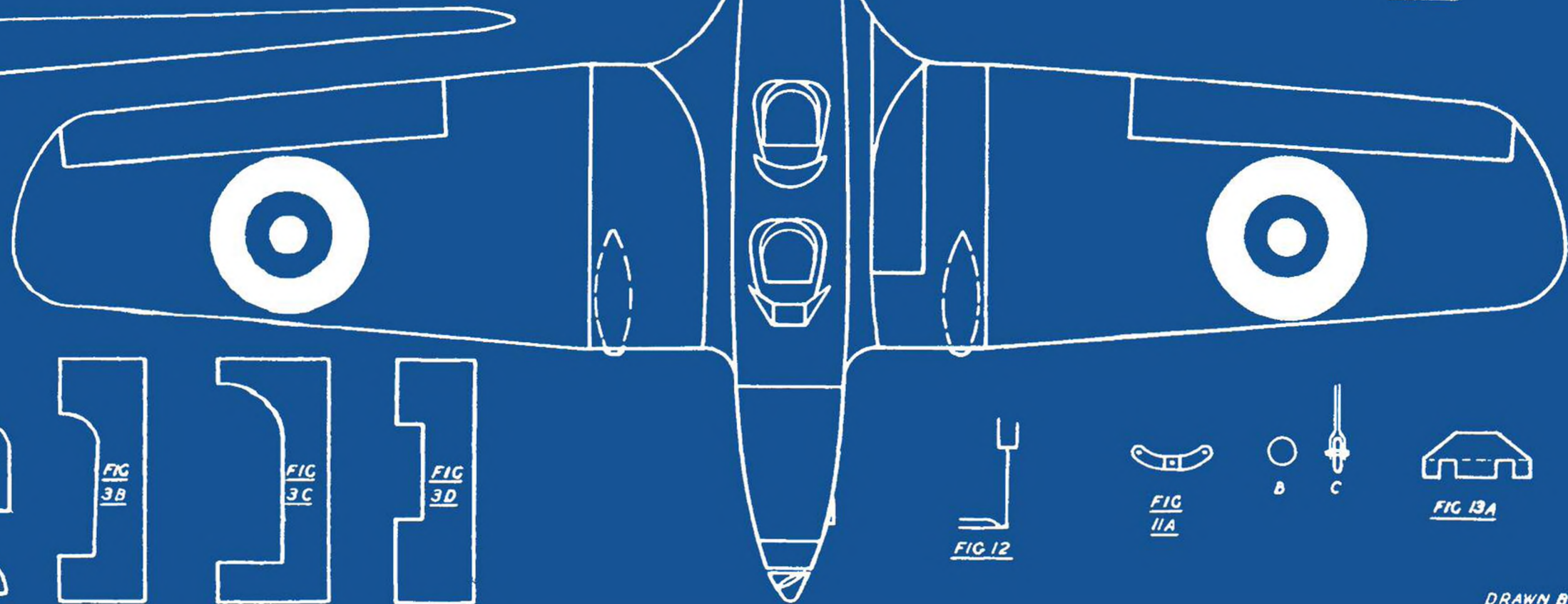
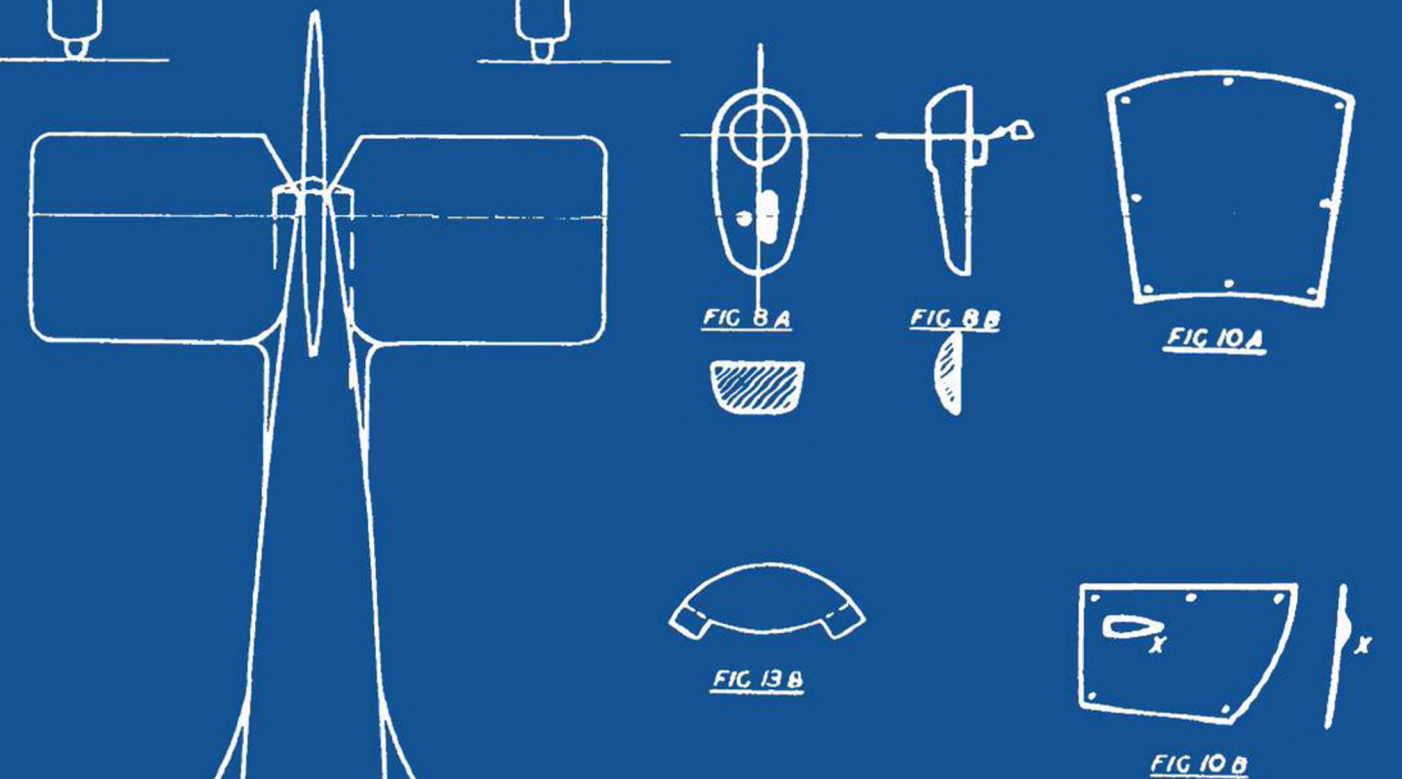
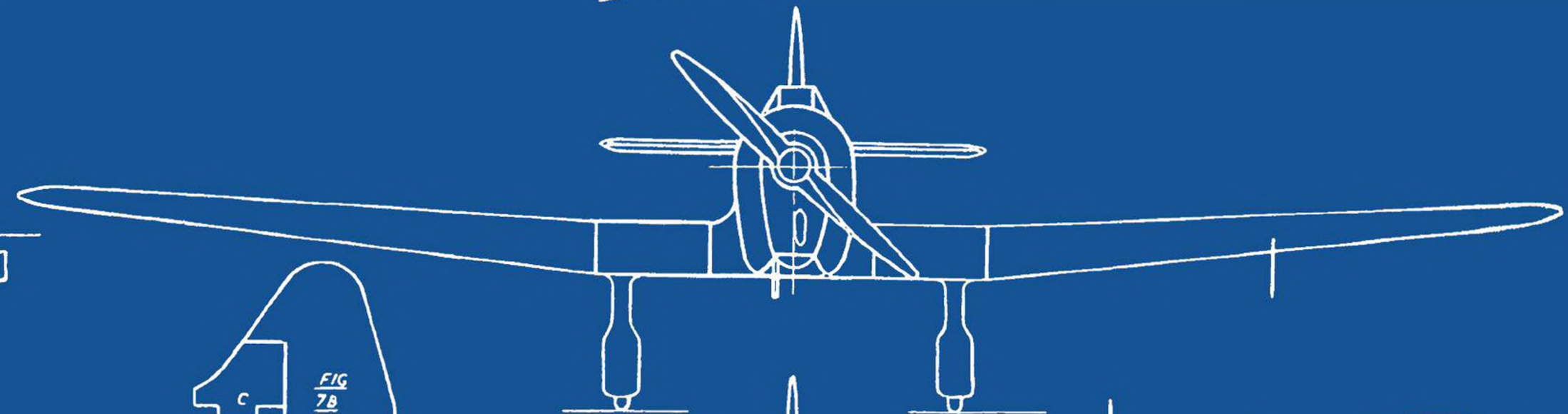
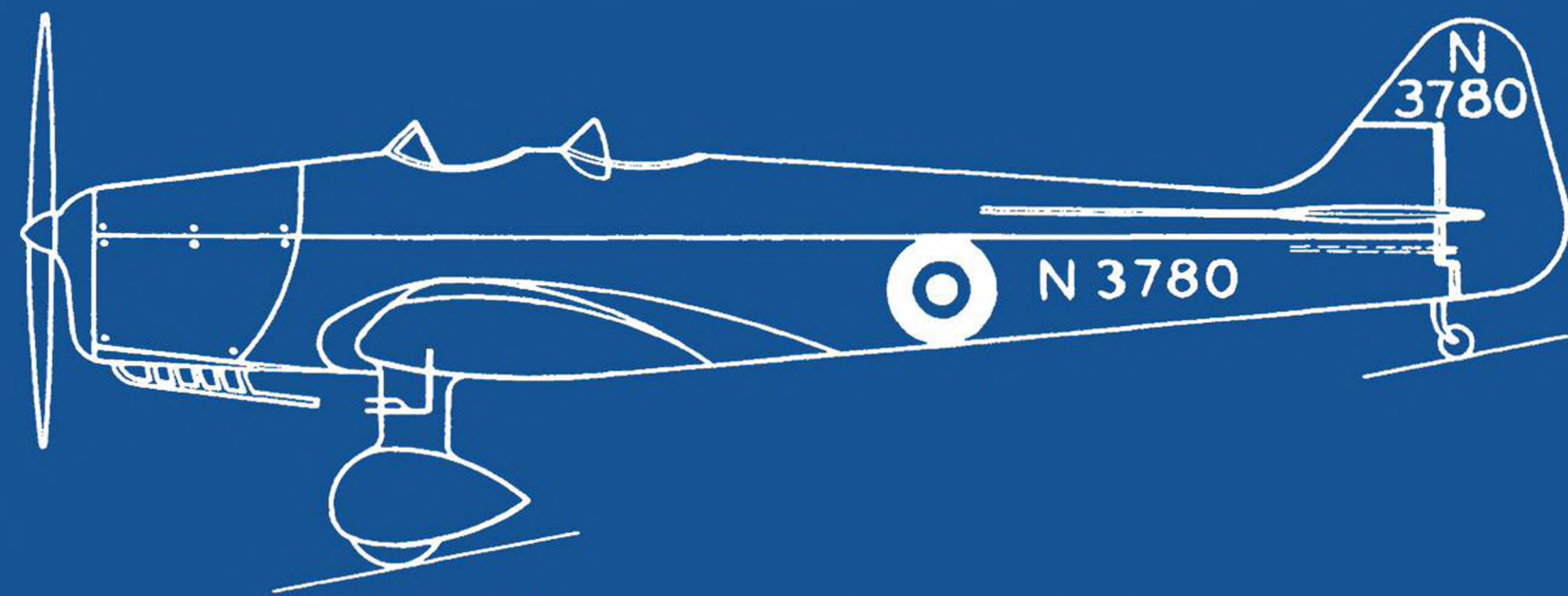
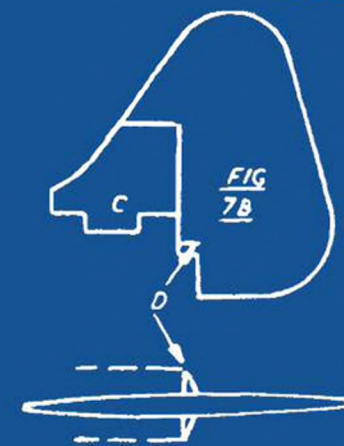
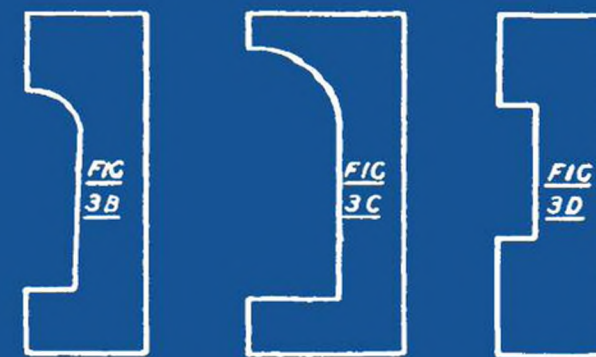
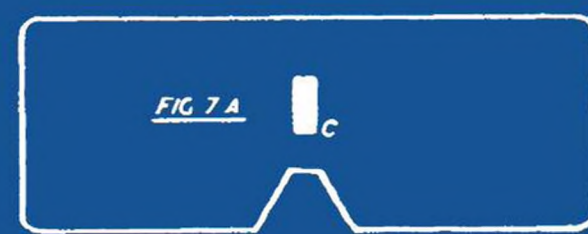
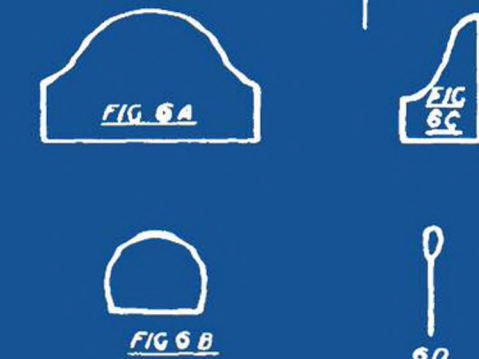
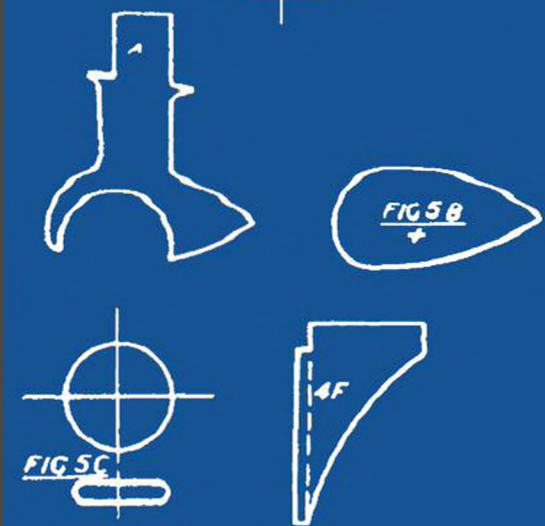
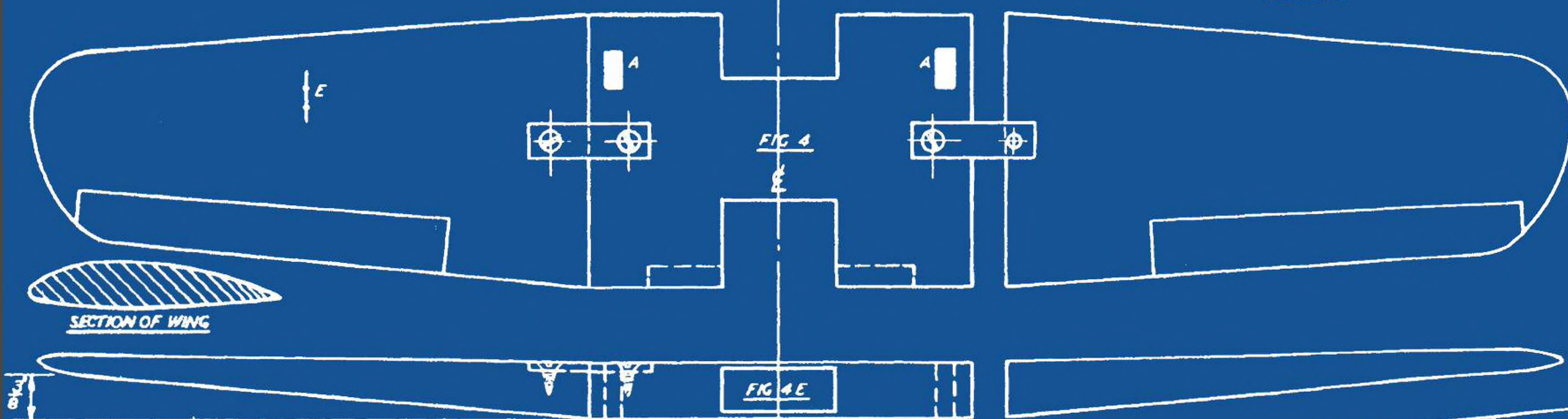
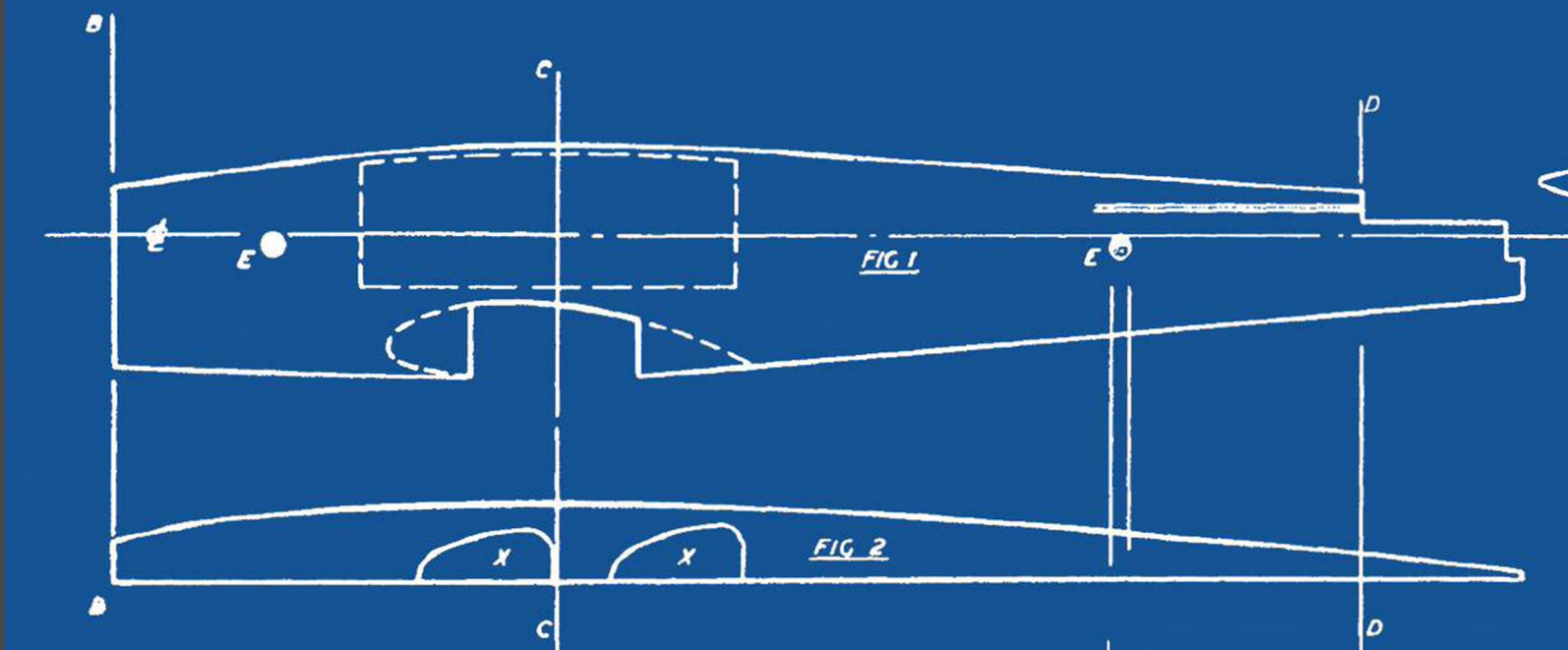
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